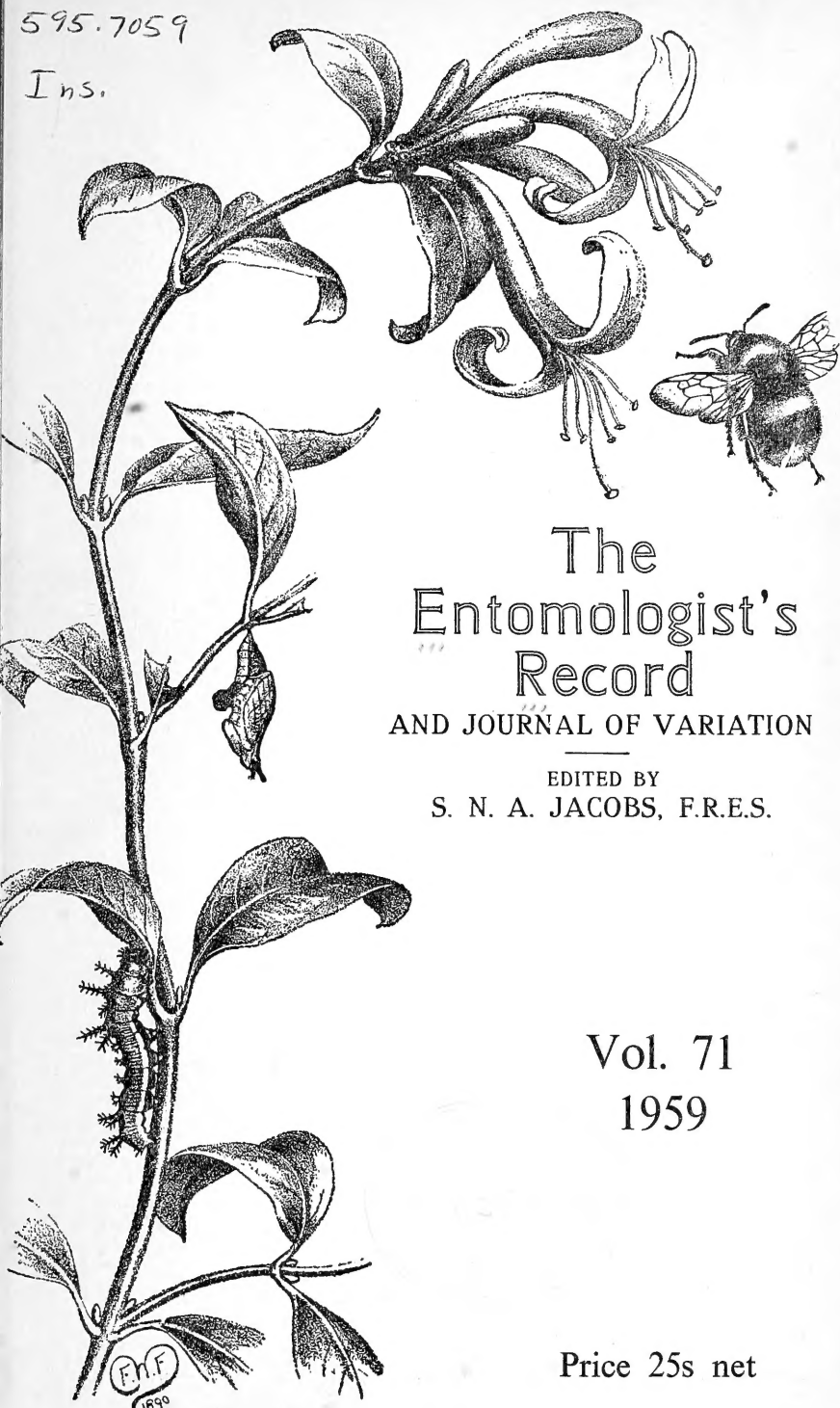


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The
Entomologist's
Record
AND JOURNAL OF VARIATION

EDITED BY
S. N. A. JACOBS, F.R.E.S.

Vol. 71
1959

Price 25s net

v. 71

1959

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595. 7059

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Edited by S. N. A. JACOBS, F.R.E.S.

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JOURNAL OF VARIATION

VOL. 71

15TH JANUARY

1959

On the Fluctuation of Insect Populations

By A. G. CAROLSFELD-KRAUSE

I have read the article on biotopical changes in the twentieth century (*Ent. Rec.*, 70: 225) with special interest, for we have the same trouble with the decline of insect populations here as you have in England. I am not, however, inclined to agree with the writer when he says that changes of biotopes may be considered as the main factor.

As most people know, Denmark is not very far from being 100% cultivated, so that only small areas remain with more or less natural biotopes. This state of affairs ought to have destroyed a considerable number of insect species, and of course this must have happened to some species; but if one checks with old lists for disappearing species, it is amazing how few species are shown to have become rarer, and most of these which have left their old haunts have certainly not done so on account of biotopical changes. Thus, in Boserup wood, where my late father and I collected during my boyhood and part of my youth, two species of Rhopalocera have disappeared entirely: *Par-nassius mnemosyne* L., which disappeared in 1900, and *Ly-menitis camilla* L., which did so in 1923. Before those dates, *mnemosyne* flew commonly in the wood, and *camilla* was the "type species" there, being extremely numerous. The biotope has not changed and is still the same now, 35 years after the disappearance of *camilla*. The wood has of course been subject to common forestry, but as a whole little has been changed, and the food-plants for both species, *Corydalis* spp. and *Lonicera xylosteum*, are still present in large quantities.

The really odd thing is that most of the species which have exhibited a decline in numbers or which have disappeared from old haunts are exactly those whose biotopes have remained unchanged. If a change of biotopes has influenced the number of species, then this must have happened very many years ago, at least here in Denmark, as I am unable to find any traces of such a decline from a study of very old lists. Against the argument that changes of biotopes are responsible for 'lost' or dwindling species, there is also the fact that Denmark has a considerably richer insect fauna than Great Britain, in spite of your country's much larger area and extent from north to south and your larger areas of more or less virgin land; for in Denmark we have twenty-nine more species of Rhopalocera than you have in Great Britain. I know of course the zoogeographical arguments which could be put forward here, but we find nearly the same conditions if we compare Denmark with north Germany and the Netherlands too; in Germany at least there are vast areas still in almost a virgin state, but in spite of this our lepidopterous fauna is considerably richer in species.

From the above, you will see that I do not consider the change of biotopes as the main factor responsible for the disappearance of species. For myself, I have no doubt at all that a change in the climate is the real cause. When the two species above-mentioned disappeared from Boserup wood, their disappearance coincided with two long cold periods, one from 1890 to 1910, and the other from 1920 to 1929. The last one I remember fully; during those years the *Rhopalocera* became very reduced in numbers and some species were not seen at all over a long series of years. When I started my career in entomology at the age of eight, just before World War I, my wood was swarming with butterflies during those warm years: *Vanessa polychloros* L. was very common and I still remember it sitting on the tree trunks with wings spread in the sun. It was so common that I could not be bothered to net it! About 1920 it disappeared owing to the cold spell, and I did not see another specimen until 1932. When the warm period started about 1930 it appeared again in large numbers, and in the beginning of the 'thirties it was so numerous that I met with it in numbers flying in the shelter-belts along the coast, far from any wood, and saw it sunning itself on the telephone poles on the wide open farmland, although it is a typical woodland species.

In 1941 *camilla* appeared again in Boserup wood, but only a few, and as I now visit my boyhood's wood only very occasionally I do not know how this species is getting on now.

There is no doubt that we have entered upon a bad climatic period; reports from Greenland tell us that the sea ice is becoming heavier each year and the seals are moving southwards. In Denmark the winters have been very hard for many years, and they start earlier than I have previously experienced. We used normally to get snow about New Year, but now we get real winter in November. This should do no damage, however; but the trouble is that we get no spring before the end of May. Consequently everything is very much delayed: this year the second generation of *Aglaia urticae* L. did not appear before 1st October! The normal time for its appearance here is during the first days of August, and so many insects of various orders have been so delayed that they will not be able to hibernate satisfactorily. I am making copious notes so that we shall know what is going on and what will happen if these frosts become a constant phenomenon. Furthermore, the early spring is now a continual alternation of mild and extremely cold spells, varying from $+10^{\circ}$ C. to -16° C. The warm spells bring the pupae out of diapause and they are then killed by the following frosts. This is the main reason for the bad insect conditions here, and Dr. Hering has told me that it is just the same in Berlin.

It will give you a good idea of the Danish spring of today if I tell you that on a collecting trip on 5th June (our "Constitution Day") when full summer is supposed to start, I saw two gnats, that was all! It was as though we were in February.

We have of course had very considerable changes of biotopes in Denmark, but their effects on the composition of our fauna escape analysis chiefly on account of age or insufficient exploration of the areas in question. Thus, extreme damage to our woodland fauna must have had its climax in the last part of the eighteenth century, when our woods had become so small that Denmark at that time was one

of the most poorly wooded countries in Europe. In consequence of very drastic legislation, however, the damage was repaired, so that ten per cent of Denmark is well wooded today.

Long before our woods were re-established, a new change took place in the composition of the woods; for in 1730 *Picea abies* was introduced, which tree, together with many other foreign conifers, now covers the largest part of the Danish woodland at the expense of the deciduous trees. Further, a "rational" forestry, where large areas are planted with but one species of tree, unlike the mixed woodlands of old times, must have made a change in the fauna inevitable. These last changes of biotope took place not so long ago as to prevent our knowing at least a little of their effects. I am convinced, however, that the results of these interferences have been more of a topographical moving of the species rather than their destruction, since the species must have had, for the greater part, an opportunity to move on to a newly found biotope. I must here emphasize that I am speaking of the number of species and not of their populations; the latter may of course be temporarily diminished when a migration to a new biotope takes place; but such a decline has obviously no effect upon the number of species. I shall return to this later on.

The greatest change which has taken place in recent times is, beyond question, the cultivation of the greater part of our 2,500 square kilometres of heathland in Jutland, which was begun on a large scale in 1866. Even this great havoc to an insect fauna has not influenced the number of species on those parts of the heathland which have been left as nature reserves.

Speaking of changes of biotopes, one type of change must be left out of consideration here; I mean the total destruction of a highly specialized biotope, which must involve the equally total destruction of its fauna. But even in such a cultivated country as Denmark I do not think that it would be possible to obliterate a biotope entirely; I think that there would always remain enough to maintain a fauna, apart from those cases where a species is restricted to a small portion of a biotope, the parts of which are widely separated from each other topographically; but I do not know of a single case in Denmark where such a destruction has occurred.

I give the following as a strictly subjective opinion. I believe that a large coherent biotope is in no way more advantageous to the procreative powers of a species than a biotope split up into smaller scattered areas. I do not believe that this theory is approved by entomologists, though they must surely have experienced it in their work in the field.

I have collected *Nepticula* species very actively on the islands of Funen and Lolland, and on these islands every boundary between fields has a row of poplars, which occur in almost astronomic numbers. One would think that this would be just the place for amassing material in preference to any other locality for the poplar "Neps"; but what are the dry facts? They are that absolutely no "Neps" are present and I have abandoned hope of getting them there. No doubt the population comprises all our poplar "Neps", but it cannot be a large one and bears no comparison with the supply of foodplant. If, however, I visit places outside the farmland, where poplars of the same species occur in more

moderate numbers, and under just the same biotopical conditions, there are plenty of "Nep" mines.

To give one more example. In North-Sjælland, the north coast is bordered by a very large *Pinus* wood with lots of *Betula*, especially in broad belts round the wood. This wood, "Tisvilde-Hegn", is the most famous insect locality in Denmark, and I have collected there for about 40 years very regularly; I have also spent considerable periods there as our school has its camp-house in that place. On all the *Betula* present mines are extremely rare, only *Nepticula luteella* Stainton, *N. argentipedella* Zell. and *N. confusella* Wals. have been noted by me during all these years. Moreover the mines are only present in small numbers, but at the fishing-villages outside the wood and some distance from it there are so many mines on *Betula* that very often the trees suffer real damage by their numbers.

These two examples, which are but two out of many I have noted, compel me to doubt the alleged importance of changes in biotopes as restrictive factors in an insect fauna.

I should like to add a few remarks on the effect of the introduction of conifers on the native fauna of Denmark. In prehistoric times the country was almost completely covered by *Pinus* woods; but about 2,500 B.C. *Pinus* disappeared as a forest tree, though doubtless scattered stands held out for a very long time, perhaps a few even close to the present days. A century ago a little grove of *Pinus silvestris* still existed on a tiny island, and today a few "Krumholz"-shaped very old trees are found on the island of Laesoe. As they grow on an uninhabited and completely desolate locality known as "The Sand", these trees are commonly regarded as the very last specimens of a mighty population. The stands of *Pinus silvestris* have, however, for centuries been so few and so small that no insect species tied to *Pinus* only as a foodplant could exist in Denmark. Conifers had become so completely destroyed that but one species was left, *Juniperus communis*.

After about 1730 coniferous woods again appeared in Denmark, and if we look at the lepidopterous fauna of these woods today we find that our fauna has been increased by twelve or thirteen species of macros, introduced or the result of immigration. Of these species, only three are common all over the country, three rather common in a few localities but rare elsewhere, five are far from common, and one is very rare. The thirteenth lives upon lichens on *Pinus* trunks and is rare; but it is problematical whether it belongs to the new conifer fauna or the old.

What we have gained by reafforesting the land with new conifer woods is, as will be seen, very little, and although no visible damage has been done to the fauna of the deciduous woods it has been a bad business for entomologists. It is, however, a very interesting example of how slowly a newly formed biotope becomes inhabited if no local stock is available for populating the new virgin woods of foreign origin. I have had the opportunity to examine the reverse problem of the population of virgin land when biotopes of the same kind are present though rather far away. Thus I have studied a wood named 'Kongelunden' or 'King's Grove' on the south coast of Amager, an island close to and almost connected with Sjælland; a part of Copenhagen is built on it. The island is rather large, and has no other woods. Further, I have studied the old fortress line where I live; it is a very large and

well wooded area, just as far away from any other wood as Kongelunden. Although the fortifications were in use as late as World War I, it has from the very beginning been a very suitable biotope for lepidoptera.

Kongelunden was planted in 1818, and it had, at least in the year 1900, already become a fully populated and very fine biotope for lepidoptera, as I know from old collectors; the fortifications date from 1890 and were originally planted with timber to strengthen the ramparts. Now, although I have not lived here long enough to be quite familiar with its fauna, all problems taken into consideration it can certainly be said that it is not yet fully populated by lepidoptera, and it would therefore seem that at least a full century is necessary for building a biotope. 65 years would seem to be too short a time, even when the necessary species are present in the country. I think that these are rather suggestive facts.

Slotsherrens Have 97. Copenhagen Van. 17.xi.1958.

Butterflies of South Yorkshire and Adjacent Areas

INCLUDING NOTES ON THEIR CHANGES IN DISTRIBUTION DURING THE LAST CENTURY.

By J. HARDCASTLE SEAGO, B.Sc.

INTRODUCTION

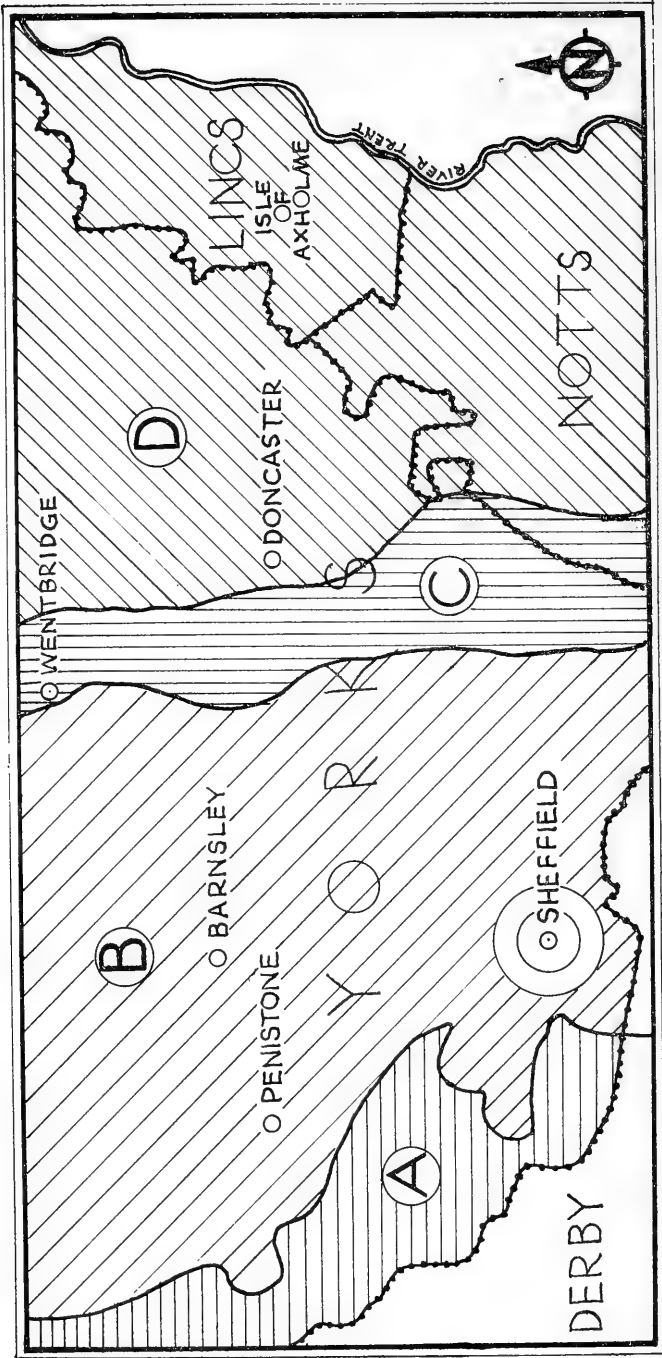
The present article seeks to give an up to date account of the status of the butterflies in an area comprising that part of South Yorkshire including Sheffield, Penistone, Barnsley and Doncaster, together with adjacent portions of North Notts. and N.W. Lincs. In this respect this account is complementary to Part 2 of "The Lepidoptera of Derbyshire since 1926" by D. C. Hulme (*Ent. Rec.*, 69: 258) since the area under review is contiguous with the N.E. boundary of Derbyshire.

It has also been possible to obtain a fairly accurate picture of the distribution of certain of the butterflies in this area during the period roughly covering the second half of the last century. A comparison of the present day butterfly fauna of the region with that of this period shows marked changes to have taken place. Similar and often synchronous changes have occurred in many parts of the British Isles during the same period and many of these alterations in distribution and abundance must be attributable to a common cause or causes. The nature of these causes is decidedly obscure but many entomologists (e.g. E. B. Ford, *Butterflies*, Chap. 7, and P. B. M. Allan, *Moths and Memories*, Chap. 3) incline to the opinion that climatic variations are responsible in many cases. If the nature of such influences is to be elucidated it appears to the writer that as much local information as possible must be collected and compared.

Some of the changes which have occurred have obviously been brought about by man, e.g. in cultivation, drainage, and industrialization. This is particularly so in the region dealt with in this article, and it seems that some account of man's influence on the butterfly population within this area might be of some future value.

NATURAL DIVISIONS OF THE AREA

The region considered includes a small portion of the Pennine hills and extends eastwards as far as the River Trent. Reference to the sketch map shows that the area falls into four natural divisions.



COUNTY BOUNDARIES - - - - -

BOUNDARIES OF NATURAL DIVISIONS ———

A. Millstone Grit. This region is largely open heather moorland, the elevation of which varies between about 1,700 and 900 feet.

B. Coal Measures. This division consists of undulating land of a generally lower elevation than that of *A*. Various types of habitat are included such as rough hill pastures, mixed woodland, and some low-lying land subjected to flooding bordering the two main rivers, the Dearne and the Don. The region also contains some artificial habitats in the form of weed covered industrial wastelands and un-used shale heaps.

C. Magnesian Limestone. An outcrop of magnesian limestone runs in a North-South direction through the district. This part of the area supports a typical limestone flora and contains some quite extensive woodland. It is also intersected at intervals by rather steep wooded valleys, *eg.* at Wentbridge and Roche Abbey.

D. Triassic Tract. This portion consists of very flat once water-logged country, much being almost at sea level. Some parts have a very sandy soil, whilst others are covered with extensive deposits of river drift known locally as "warp". Much of the region is under intensive cultivation, but the two great peat bogs—Thorne Waste and Hatfield Chase—are in this area. Long straight dykes known as drains intersect the country and these are more particularly a feature of the Isle of Axholme, the most easterly region considered in this account.

ANNOTATED LIST OF BUTTERFLIES

All the insects given as occurring at the present time have been seen or taken by the writer unless otherwise stated. Butterflies which have become extinct and those which cannot be considered truly indigenous or regular migrants are bracketed.

Pararge aegeria L. Locally common in the north of area *C*, but it is apparently absent south of Wentbridge. Its absence from non-calcareous areas of the district is surprising.

P. megera L. Widely distributed in areas *B*, *C*, and *D* and in many localities definitely increasing. Very local in area *A*. In the latter part of the last century it was regarded as scarce and local in area *B*¹.

(*Melanargia galathea* L.) Once known from several localities^{2, 3, 4, 5} in area *C*. The last reported date of its occurrence is 1858.

(*Eumenis semele* Hübner) Has been reported⁶ from two localities in the Isle of Axholme some 60 years ago. It is interesting to note that the species is quite common a few miles away on the east side of the Trent.

Maniola tithonus L. Locally common in area *D*. It has long since disappeared from *B*, where it was once known¹.

M. jurtina L. Common and widely distributed in all areas.

Coenonympha pamphilus L. Fairly common in all areas but tending to become somewhat localized away from moorland regions.

C. tullia Müll. Locally common on Thorne Waste and Hatfield Chase. At one time known from the Isle of Axholme⁶ and it seems probable that the species was once much more widely distributed in area *D* before drainage. The apparent absence of this species from area *A* is most surprising but the recent records⁷ from the Pennine region of Derbyshire suggest that a thorough search in this area might prove rewarding.

Aphantopus hyperanthus L. Occurs very locally in area *D* but is quite common in at least one locality. It has been extinct in areas *B* and *C* for many years^{1, 4}.

(*Argynnis selene* Schiff.) Once known from areas *C* and *D*^{4, 5}.

(*A. euphrosyne* L.) This species has been recorded from *B* and *C*^{1, 4} but has been extinct for possibly 50 years.

A. aglaia L. Sometimes quite common in very restricted localities in areas *B* and *C*. Early records from *B* are quite lacking.

(*A. adippe* L.) This species probably only occurs as a wanderer. There are two records for 1901 from area *B* and one for the same year from area *C*⁴. Perhaps the most recent record is that of Mr. G. E. Hyde for 1917 in area *D*⁸.

(*A. paphia* L.) Present in area *C* sixty or more years ago⁴. A single female was captured in area *D* by Mr. G. E. Hyde in 1953.

(*Euphydryas aurinia* Rott.) Reported in 1842 from one locality in area *C*⁹.

Vanessa atalanta L. Often common in all regions.

V. cardui L. Less frequent than the preceding species. There is no doubt that when present it exhibits a preference for the higher ground in areas *A* and *B*. This peculiarity would be difficult to detect by casual visitors owing to the erratic appearances of the insect. At least one other observer has noted this phenomenon in an adjacent region¹⁰.

Aglais urticae L. Widely distributed in all areas and usually common.

(*Nymphalis polychloros* L.) Probably once resident in much of areas *B*, *C* and *D*. In 1883 it was reported as being less common than formerly in area *B*¹ and extinction probably took place about this time.

N. io L. This species has been noted in all areas, but it seems to have declined somewhat in numbers during the past three or four seasons; it has, however, suddenly become plentiful in the present season.

(*N. antiopa* L.) A few specimens were taken in several seasons during the latter half of the last century⁴. In 1872 no less than six specimens were taken at Barnsley in area *B*.

Polygonia c-album L. This species was probably once well-established in areas *B*, *C* and *D*^{1, 4, 5}, but it was probably quite extinct by the end of last century. It re-appeared in the district around 1945 and every year after that date the writer saw one or more specimens in area *B*, until 1950. It seems almost certain that the species has failed to re-establish itself.

(*Hamearis lucina* L.) This seems to have been known from several localities in area *C*^{2, 4, 5}, but there are no recent records.

(*Cupido minimus* Fuessl.) Once known from two localities in area *C*⁵ but no recent records are known.

Polyommatus icarus Rott. Locally common in all areas. The species is single-brooded in area *A* and in at least one locality in area *D*.

(*Cyaniris semiargus* Rott.) This extinct species was once well-established in the Isle of Axholme in area *D*. T. H. Allis recorded a single specimen from this locality in E. B. Newman's *British Butterflies* and S. Hudson recorded "several near Epworth" (*Ent. W. int.*, 1860, Vol. 8, p. 139) and also "I find it in meadows, but they are of

large extent; and the insect appearing just before the grass is ready for the mower, prevents a proper search being made for it" (*Zoologist*, 1864). The same entomologist recorded in a private communication to the Rev. E. A. Woodruffe-Peacock in 1903 that it was not extinct⁶. Many lepidopterists have since investigated the locality but without success.

Uelastrina argiolus L. This species suddenly became quite common in areas *B*, *C* and *D* in 1948 but the following year it became rare. It certainly exists at the present time in certain localities in area *B* and it may well be established elsewhere as a rarity.

Lycaena phlaeas L. Locally common in all areas.

Callophrys rubi L. This species has possibly always been an inhabitant of the moors around Sheffield but some of the most recently recorded localities in areas *A* and *B* represent an extension of its range in the district.

Strymonidia w-album Knoch. Has occurred recently in at least two restricted localities in area *D*. It was once known from areas *B* and *C*², ⁴, ⁵, but recent information from these portions of the district is lacking.

Pieris brassicae L. Common throughout the district.

P. rapae L. Common throughout the district.

P. napi L. Common throughout the district.

Anthocharis cardamines L. Locally common in all areas except *A*, from which it is probably quite absent.

Colias croceus Fourcroy. In its years of abundance it is often present in small numbers. It was particularly common in 1947 in area *A*.

Gonepteryx rhamni L. Very rare, but there are recent records from areas *B*, *C* and *D*.

Erynnis tages L. Local in areas *B*, *C* and *D*. It has recently become quite common on certain abandoned shale tips in the Barnsley area.

Pyrgus malvae L. Local and by no means plentiful in areas *C* and *D*. It has recently appeared in one locality in area *B*, from which portion of the district it has never been previously recorded.

Thymelicus sylvestris Poda. Very local in areas *B*, *C* and *D* though recent opencast coal operations have probably exterminated it in area *B*.

Ochlodes venata Bremer & Grey. Locally common in areas *B*, *C* and *D*. This species was certainly very scarce in the last century in area *B*¹ and it has probably gained ground generally during the last ten years or so.

DISCUSSION OF THE LIST

It is evident that certain species which have become extinct in a wide range of other localities in the British Isles have suffered a similar fate in this area. This group contains *polychloros*, *c-album* and *semiargus*. The recent appearances of *c-album* suggest that this species established itself temporarily but the region is evidently still generally unsuitable for it. The list also contains another group of extinct species, which were once inhabitants of the limestone area, namely, *galathea*, *aurinia*, *lucina* and *minimus*. These cannot be said to have suffered generally in their range in the British Isles but certain syn-

chronous changes in the distribution of all four species have taken place in adjacent areas. Thus *lucina* and *minimus* were once known from the carboniferous limestone area of Derbyshire but both have evidently become extinct there⁷. *E. aurinia* seems to have suffered generally in eastern England: it is now quite unknown in Yorkshire and Derbyshire and it seems to have become extinct in Lincolnshire where it occurred until quite recently. *M. gaultheria*, too, became extinct in a wide range of localities in Lincolnshire and Nottinghamshire, possibly 70 or more years ago, but this species has rather strangely survived in the Yorkshire wolds.

The area is a particularly poor one for fritillaries and the few which were once known have long since disappeared with the exception of *aglaia*, which has apparently extended its range a little.

It might be thought that the intensive industrialization of area *B* and the drainage and cultivation of *D* would have had a most adverse effect on many of the butterflies. Whilst this may be true in specific instances, e.g. the disappearance of *tullia* from parts of *D*, the reverse seems to be the case in at least some species. *P. megera*, *rubi*, *aglaia*, *tages*, *malvae* and *venata* have all increased recently and have extended their ranges in area *B*. Of these species *megera*, *aglaia*, *tages* and *venata* have all colonized industrial wastelands in one or more places. The cultivation of much of area *D* must have eliminated many habitats but the banks of "drains" in this region have provided new ones and of the more local butterflies *hyperanthus*, *tithonus* and *sylvestris* are all known from such situations.

It has been shown that man's influences on the butterflies in the region under review have not been entirely deleterious and the natural adaptability of certain species has allowed them to colonize some rather artificial habitats. However, certain new threats will probably have to be faced in future. Two of the most serious of these are the growing practice of the use of weed killers on lane sides, etc., and the cultivation of marginal land. All these general remarks apply equally well to the moths, but many of these appear to have been much more successful than the butterflies in adopting industrial wastelands as their home and it is hoped to deal with some of these in a future article.

REFERENCES.

1. A list of the Macrolepidoptera of Barnsley by W. E. Brady, *Trans. Barnsley Naturalists Soc.*, 1883, p. 48.
2. *British Butterflies*, by E. B. Newman, 1869.
3. *Ent. Weekly Intelligencer*, 1858, p. 133.
4. *List of Yorkshire Lepidoptera*, by G. T. Porritt, second ed., 1904.
5. *British Butterflies*, by F. O. Morris, 1860.
6. A List of Lincolnshire Butterflies, by G. W. Mason, *Trans. Lincs. Nat. Union*, Vol. 1, 1905-8, p. 76.
7. The Lepidoptera of Derbyshire since 1926, by D. C. Hulme, Part 2, *Ent. Rec.*, Vol. 69, p. 258.
8. Note on Yorkshire Lepidoptera, by G. E. Hyde, *Ent. Rec.*, Vol. 69, p. 249.
9. Record by John Heppenstall, Newman's *Entomologist*, Aug. 1842.
10. Rev. F. C. R. Jourdain, *Derby. Arch. and Nat. Hist. Soc. Journal*, 1903, p. 229.

In February we shall print, among others papers, the following: *The Mating of Hepialidae*, by A. G. Carolsfeld-Krause; *Nothris congressariella* on *Tresco*, by R. M. Mere; *Butterflies taken in the Valais District of Switzerland*, by Lt. Col. H. Bridges, with localities for species; and *Swarming in six spp. of Empididae*, by Dr. B. R. Laurence.

Moths at the M.V. Trap in East Herts in 1958

By C. CRAUFURD

This is the sixth year the trap has been used in my garden and it is undoubtedly the poorest year in the number of moths and of species. Throughout the year there have been cloudy days and more often than not clear nights with a drop in temperature which certainly does not induce moths to fly. 305 species were recorded in 1956 and 281 in 1957, whereas up to date this year only 240 have been counted. In 1956 the count was 22,316 insects, in 1957 12,410 and up till 5th October this year 8,100.

The following is a list of those moths which usually appear before the end of May in fair numbers:—

	1956	1957	1958
<i>Orthosia gothica</i> L.	1060	852	383
<i>O. incerta</i> Hufn.	679	426	144
<i>O. stabilis</i> Schiff.	270	150	20
<i>O. cruda</i> Schiff.	87	150	10
<i>Lycia hirtaria</i> Cl.	180	97	65
<i>Luothoe populi</i> L.	100	89	37
<i>Spilosoma lubricipeda</i> L.	485	184	108
<i>S. lutea</i> Hufn.	607	303	107
<i>Hepialus lupulina</i> Hufn.	485	184	285
<i>Rusina umbratica</i> Göze	423	464	258
<i>Opisthograptis luteolata</i> L.	165	112	95
<i>Agrotis exclamationis</i> L.	1021	657	509
<i>Plusia gamma</i> L.	223	141	309
<i>Biston betularia</i> L.	234	115	36
<i>Ochropleura plecta</i> L.	190	158	88
<i>Diataraxia oleracea</i> L.	413	119	43
<i>Lomaspilis marginata</i> L.	242	82	68

The same drop in numbers occurs among the commoner species which normally appear in June and onwards:—

	1956	1957	1958
<i>Amathes c-nigrum</i> L.	2930	316	359
<i>A. triangulum</i> Schf.	203	179	55
<i>A. xanthographa</i> Schf.	100	69	133
<i>Diarsia rubi</i> View.	388	91	74
<i>Axylia putris</i> L.	199	169	18
<i>Melanchra persicariae</i> L.	620	596	42
<i>Plusia chrysitis</i> L.	335	371	119
<i>P. iota</i> L.	61	87	53
<i>Leucania pallens</i> L.	431	155	48
<i>L. impura</i> Hb.	361	255	186
<i>L. conigera</i> Schf.	115	32	64
<i>Triphaena pronuba</i> L.	718	283	356
<i>T. comes</i> Hb.	150	46	83
<i>T. ianthina</i> Schf.	135	164	45
<i>Apamea secalis</i> L.	246	154	178
<i>A. monoglypha</i> Hufn.	357	51	82
<i>Arctia caja</i> L.	197	79	24

<i>Euxoa nigricans</i> L.	180	17	50
<i>Polia nitens</i> Haw.	122	20	21
<i>Hubrosyne pyritoides</i> Hufn.	82	46	8
<i>Procus strigilis</i> Cl.	218	239	83
<i>Luperina testacea</i> Schf.	70	35	55
<i>Sterrrha aversata</i> L.	133	54	153
<i>Chiasma clathrata</i> L.	103	27	14

I have no doubt many m.v. trap users would be pleased to have so few *pronuba* and *monoglypha*, but the area over which the light is diffused in my garden is very limited. *P. gamma*, *xanthographa* and *aversata* increased in numbers, but *stabilis*, *cruda* and *pyritoides* were very scarce.

This year *Hadena compta* Fabr. came to the trap again. As I have not heard of *compta* being taken so far inland as Bishop's Stortford I would like to put the following dates on record. On 20th July 1954 I took one from the window of a local garage as already recorded, one came to m.v. on 22nd July 1956 and two on 5th July 1957 and 10th July 1957. Two came this year on 10th July and 1st August. Last year I collected all the flower heads of the sweet Williams in the garden into a large cardboard box, and four *compta* emerged on, respectively, 7th June (1), 19th June (2) and 18th July (1) of this year; ten in all. There is a large nursery garden within 200 yards where sweet Williams are grown in quantity.

In August last year I visited Aviemore with my friend Mr. Francis Noble and had the pleasure of taking for the first time *Amathes glareosa* Esp. at sugar. On 7th September this year Mr. Noble took me to the Breck and I obtained two *glareosa* at sugar. On 14th September I was surprised and delighted to find a *glareosa* in my m.v. trap at home; it was in perfect condition. This is the first record for the district, and so far as I have at present ascertained the only new moth to be recorded this year.

Last year I had the pleasure of rearing *Catocala nupta* L. for the first time from larvae from weeping willows in the garden and in previous years *nupta* has been a common insect in the district; but this year I have seen two only on lamps, on 9th September and 29th September.

We have had two very mild winters following one another which has been very good for the birds but bad for insects. If the winter of 1958/9 is a hard cold one we may hope that 1959 will be a better year. I believe that the records for the last 100 years show that a good summer for insects has followed a hard winter.

The 1958 Season in East Essex

By A. J. DEWICK

On the coast of east Essex, 1958 has been above average for migrants; given better weather, it might have been outstanding.

In spite of the encouraging omen of a swallow on 1st April, the first half of the month was cold with continual N.E. or N. winds; not until the 18th did the temperature manage to stay above 40° F. during the night.

The first *Pieris rapae* L. was seen on 21st April as well as the first

cuckoo and more swallows. A single *Plusia gamma* L. appeared in the light trap on the 24th. A spell of mainly S.W. winds began on 5th May; on the 8th, *P. gamma* appeared again, accompanied by *Nomophila noctuella* Schiff. *Vanessa cardui* L. was seen on the 11th, followed by *V. atalanta* L. on the 14th. By the 31st, eight of the former and seven of the latter had been seen. *Heliothis peltigera* Schiff. appeared in the trap on the 19th, the first time I have recorded it in May.

During June, *V. cardui* continued commoner than *V. atalanta*, with totals for the month of 43 and 16 respectively. A single male *Colias croceus* Fourc. was seen flying north along the sea wall between the Crouch and Blackwater on the 14th. Further single specimens in July, August and September brought the year's total to four only. The first and only *Macroglossum stellatarum* L. was seen on the 18th and *Anania nubialis* Hübn., which is probably a resident here, appeared on the 30th.

During July the numbers of *V. cardui* and *V. atalanta* decreased to 12 and 11 respectively, but fresh specimens of both appeared, *cardui* on the 19th and *atalanta* on the 24th. A specimen of *Spaelotis ravida* Schiff. appeared in the trap on 12th July, being the first of four in July and 16 during August, apart from others in outbuildings and sheds, etc. Also on the 12th I was surprised to find a quite fair male *Haplotis venustula* Hübn., the first I have taken. A very good female arrived on the 16th, and after laying a couple of dozen eggs, which proved to be infertile, died suddenly, still in good condition. On the 13th another species new to me was a female of *Hadena compta* Fabr. in very worn condition. Flowers of Sweet William caused her considerable interest, but egg-laying was not actually observed. Since, however, the five pupae which finally resulted seemed a bit small for *H. bicruris* Hufn., I am living in hope. A worn male *Acherontia atropos* L. was in the trap on the 14th and a male *Laphygma exigua* Hübn. on the 30th.

August brought an increase in the numbers of the common migrants; *cardui* to 18 and *atalanta* to 134; of the latter, 52 were counted on *buddleia* on the 21st, while on the 30th, 45 were counted in about 90 minutes flying steadily south across lucerne in full flower; none was moving in any other direction; three *cardui* accompanied them. The wind was S.W., light. The numbers of *P. gamma* also increased early in August; on the 4th there were 243 in the trap and also a male *Eulia formosana* Hübn. On the 7th, there were 342 *gamma* and my first ever *Plusia ni* Hübn., a female in good condition, which obliged with a large number of fertile eggs. Two days later I was amazed to find another *P. ni*, a male this time. Next day, the 10th, *gamma* had increased to 1,756 and *noctuella*, which had not previously reached double figures, to 31. A male *H. peltigera* was also taken. On the 11th, *gamma* and *noctuella* had dropped by more than half, but yet another *P. ni* was taken.

The next three days were quieter, with only a male *L. exigua* on the 12th. On the 15th, after a still, warm, cloudy night, *gamma* reached the unusual figure of 3,674, with 80 *noctuella*, a perfect pair of *peltigera*, a male *exigua*, and still another male *P. ni*. On the morning of the 20th I noticed a small footman in the trap; it turned out to be a perfect male *Eilema pygmaeola* Dbld. Compared with specimens from Deal

it is darker on the forewings, while the light area of the hindwings is more yellowish tinged, so it may have been of Continental origin.

During September the numbers of *cardui* and *atalanta* decreased a little, the former to 12 and the latter to 89. A substantial departure of *atalanta* must have occurred in late August and early September; on the 1st, 39 were counted on *buddleia*, but that was the last occasion on which it was seen in any quantity. The next morning one was found in the m.v. light-trap. Migrant moths continued well to the fore during the first half of September; a perfect male *Herse convolvuli* L. appeared on the 15th, the only one of the season, and a male *Heliothis armigera* Hübn. on the 18th, while *gamma* totalled 738 on the 2nd and 725 on the 3rd. Other species were: *L. exigua*, males on 2nd, 3rd, 10th and 14th (two), and a female on the 6th. *Nycterosea obstipata* Fabr. males on 2nd, 5th and 15th (two); *Margaronia unionalis* Hbn. males on 4th, 6th, 7th, 9th, 15th and 17th, females on 10th and 14th.

October brought a general falling off in numbers; *cardui* one, *atalanta* eight. On 29th and 31st single specimens of *atalanta* were seen flying strongly to the south; none has been seen since then. A pupa of *A. atropos* was brought me from a local potato field on the 17th, three on the 27th and three more on the 29th.

In November conditions were quite good for light up to the 9th; it then became colder, and up to the present has not recovered. A specimen of *Calothyranis amata* L. was found in the trap on 1st November, surely a very late date. A male and female *N. obstipata* occurred on the 5th, two females on the 7th and three females on the 8th.

It was a better than average year for *Hapalia martialis* Guen. (*ferrugalis* Hübn.) with a total of 28; 10 in August, 11 in September, 7 in October. *N. noctuella* was also well above average with a total of 513. The only better years were 1949 (650) and 1955 (847). *P. gamma* was also above average with a total of 20,100. This was only slightly exceeded in 1954 and 1956, but substantially so in 1950 (34,630).

Bradwell-on-Sea. 23.xi.1958.

On *Epitriptus cingulatus* F. (Dipt., Asilidae); Its Distribution and Habits

By L. PARMENTER, F.R.E.S.

At one time Asilidae could be seen in the west end of London. *Asilus crabroniformis* L. was captured in Hyde Park. Of recent years no records are available and none of the family has been found in the City despite the collecting of diptera made on the bombed area about Cripplegate. Recently Mr. J. F. Burton handed me two male *Epitriptus cingulatus* F., one captured by him on an elder bush on Blackheath, Kent, and the other on a gorse bush at the same place, both on 3rd August 1957. His locality is nearer to St. Paul's than Mitcham Common, Surrey, where two days later I photographed a male as it crouched among grass on the roadside bank edging the golf course. Ten years previously I had found it on the same common when studying the habitat of *Dysmachus trigonus* Mg. there.

In 1909, G. H. Verrall recorded the fly as "fairly common and widely distributed in Britain . . . Cornwall, Devon, Dorset, Somerset, Gloucestershire, Hampshire, Sussex, Surrey, Middlesex, Suffolk, Nor-

folk, Worcestershire, Merioneth, Nairn, Elgin and Aberdeen". Thus it may occur in most of our counties, but records are lacking for many of them and its present status can only be guessed at, so few entomologists pay attention to these interesting insects.

In Cornwall, Verrall had records for Penzance, Lizard and Boscastle. The Rev. A. Thornley in 1929 added St. Ives, Carbis Bay, Lelant Towans, Lamorna Cove and mentioned Dr. C. G. Lamb's capture of the fly at Padstow. Prof. O. W. Richards found it at Treen and Dr. W. S. Bristowe collected it on St. Mary's, Scilly Isles. From 1935 onwards, I have found it along the hedgerows of Hayle, on the sand dunes or towans of Hayle and Gwithian and at Marazion. Elsewhere I have taken it at All Hallows, Kent, Limpsfield and Wisley in Surrey. In this last county H. A. Saunders found it at Walton and H. J. Burkill took it at Byfleet. I also have specimens taken by K. M. Guichard in Epping Forest, Essex and in the New Forest, Hants. by H. J. Turner. A. H. Hamm reported it as "not common, occurring occasionally in the University Parks, Oxford, and also took it at Shotover Hill, Oxford". H. Audcent found it at Olveston and J. Bowden at Moorend, in Gloucestershire. Further north H. Britten regarded it as rare in Cheshire.

G. H. Verrall's dates of 11th July to 9th September can be extended for A. H. Hamm took it on 1st July and Prof. J. W. Carr, who found it in Nottinghamshire first at Sherwood Forest, recorded two males from Walesby Forest as late as 14th October in 1922.

W. Lundbeck knew of but one specimen for Denmark. A. Melin found it to be fairly common in certain localities in Sweden but confined to the south-east.

Dr B. M. Hobby studied the species in a sandy locality at Longdown, in the New Forest among heather and bracken from which it hunted; also on the bare surface of the ground, along a dusty roadside, and on dung. Ringdahl found the species amongst heather along the coast of Norway but Melin stated that it "haunts grass and flowers on meadow slopes, roadsides and the baulks of ploughland, where it sits on leaves and stalks, stones and the ground itself". In this country it appears to favour areas with light or sandy soils and is absent from clay, chalk areas and actual woodland.

Unlike *Philonicus albiceps* Mg. which lays her eggs in sand and has her ovipositor tipped with spines, the ovipositor of *E. cingulatus* is narrow, pointed and spineless. Melin watched a female laying eggs in the recesses of leaves of low herbage, the habit of most of our Asilidae. When describing the larva and pupa, Melin had only six specimens of the larva and three pupae. I do not think the early stages have been seen in this country for no one has restricted his time to the task of studying the family intensively.

The adult fly captures and kills other insects. It makes only short darts at small prey in general. Melin found as its prey "a little fungus-gnat, several Acalypterate Muscids, such as *Meromyza pratorum*, *Hydrotaea* sp. and various Cicadae and plant lice". Dr. B. M. Hobby has found as its captures:—*Dicraneura similis* Edw. (Hemiptera, Jassidae), *Thecabius affinis* Kalt. (Aphidae), the blue bottle *Calliphora erythrocephala* Mg., *Musca autumnalis* Deg., *Helina nivalis* Zett., the Sepsid *Nemopoda cylindrinca* F. and the Borborid, *Copromyza hirtipes*

R.D. A. H. Hamm found its capture of *Simaethis fabriciana* L. and of the Muscid, *Helina communis* Desv.; Prof. O. W. Richards, the capture of the Syrphid, *Melanostoma mellinum* L., and Dr. W. S. Bristowe, its taking of *Muscina stabulans* Flin.

I once found a female with *Sciara thomae* L. as prey, on the 'fixed' sand dunes in west Cornwall where a few days later another female *cingulatus* was found captured by the Asilid *Philonicus albiceps* Mg. which hunts its prey on the bare sand between the tufts of marram grass. Out of fourteen cases, five *cingulatus* were male and nine females, but I have generally found more females than males when collecting or observing the species.

Unlike the species of *Leptogaster* and *Dioctria* that hunt on the wing, *E. cingulatus* hunts from the ground, low stones and occasionally from the herbage. It appears to keep to a restricted area, returning to it when disturbed, although Melin found one female that never returned to the same spot.

I have not observed any courtship. Paired flies have been seen, the male on the female's back with the tip of the abdomen turned underneath the female's abdomen with the claspers bent to the ovipositor.

The only other species of the genus taken in the country, *arthriticus* Zeller, was taken on 15th July 1907 at Merton, Norfolk, by Lord Walsingham and J. H. Durrant. It was a female and had captured a male *Eucosma fulvana* Steph. (Lep., Tortricidae).

The Coleoptera of a Suburban Garden

6—Brachelytra (Part I)

By A. A. ALLEN, B.Sc., A.R.C.S.

(Continued from Vol. 68, page 222.)

The section Brachelytra contains only the immense and indeed unwieldy family Staphylinidae (unless the Pselaphidae be included); though its constituent subfamilies, or many of them, may eventually well be raised to family rank—an arrangement not without its practical advantages. In nomenclature I have thought it best to follow Kloet and Hincks (1945) with few exceptions, both for the sake of uniformity with the rest of the list and also because certain changes proposed since are open to possible criticism and have not yet been generally adopted.

PIESTINAE.

Siagonium quadricorne Kby.—Casual examples have occurred twice: on sweeping-net, l.viii.53; by beating rambler roses, 24.vii.58. This subcortical species may possibly breed in the garden, but it has not yet been found under bark there

MICROPEPLINAE.

Micropeplus fulvus Er.—In compost, grass-mowings and other decayed vegetable matter; in grass-litter from spring to autumn; can be found throughout the year and is perhaps commonest in winter, but is erratic and never really plentiful.

OMALIINAE.

Metopsia gallica Koch (= *clypeata* auct. Brit. nec Müll.).—At roots of grass and other herbage, occasionally under pieces of wood, etc., in moist places; chiefly in early spring and late autumn; sporadic and occurring singly as a rule, rarely two or three at a time in any one spot. First noted in 1951.

Megarthritis depressus Payk.—Generally rather common, but not abundant, in most kinds of vegetable refuse and debris, rotting herbage, etc., throughout the year; once or twice under carrion (fish).

Megarthritis affinis Mill.—Under the same conditions and often with the last, if anything of somewhat more frequent and regular occurrence. Both species were met with by sweeping and on the wing over most of the garden one day in May 1957 (weather being apparently normal).

Megarthritis denticollis Beck.—With the two preceding, but distinctly more sparing and more erratic in incidence; not noticed before 1947 or thereabouts.

Megarthritis sinuatocollis Lac.—A male of this species, for which a look-out had been kept for many years, has just (9.x.58) been shaken out of a handful of dead twigs, sticks and broken-down vegetation.

Proteinus ovalis Steph.—Common in and about carrion, also in putrid vegetables, wet and foul compost; odd specimens in grass-cuttings, litter, dead leaves and humus.

Proteinus brachypterus F.—Not uncommon in the same habitats, but not as a rule mixed with *ovalis*, and less often found. Once by sweeping a lawn.

**Acrolocha minuta* Ol. (= *striata* Grav. nec Fowler, Joy).—In old cut grass and compost, decaying herbage, more rarely in drier litter and several on one occasion in rotten plums; a true winter species, found exclusively from about November to February; uncommon as a rule and not seen in some years, but in others it has occurred rather freely; rare in the last few seasons. When first found in 1946 it was not certainly known as British, and indeed this remains almost the only locality up to now. (See *Ent. mon. Mag.*, 1957, 93: 99.)

Acrolocha sulcula Steph. (= *striata* Fowler, Joy, nec Grav.).—Under similar conditions, in autumn, but only two specimens hitherto (8.ix.53, 19.x.54); elsewhere it sometimes abounds in dung or rotting fungi.

Phyllodrepa floralis Payk.—By beating blossoms in spring and early summer (hawthorn, lilac, *Pyracanthus*); not rare. It appears to breed chiefly in wood-pigeons' nests.

Phyllodrepa vilis Er.—Occurs sporadically in various habitats: flowers of *Pyracanthus*, May; by beating apple and pear trees, June and September; in small numbers in grass-heaps and old rotten and mouldy plums, November and December; twice found crawling up a wall of the house. More usually met with under bark elsewhere.

**Hypopycna* (*Phyllodrepa* auct. partim) *rufula* Er.—This very rare insect has turned up in the garden of late years in considerable quantity; when first taken (three in 1952) there was but one British specimen on record—from Ashted, Surrey. In vegetable refuse, especially grass-litter, in which it can sometimes be trapped freely; also sparingly under bricks and boards in damp places, rarely by sweeping, in dead leaves, and in loamy soil. An autumnal species appearing in mid-September and lasting to early or mid-November.

Once crawling on house wall (2.x.53). The species suffered a severe check in 1956 when it could not be found at all, but seemed to be recovering the next year. (The only other British record known to me is for Colyton, S. Devon, one in coll. E. M. Eustace which I found mixed with *Eusphalerum* (*Anthobium* auct.) *pallidum* Grav.)

Omalium rivulare Payk.—Common in decaying plant material and compost, especially when in an advanced state of putrefaction; though abundant at times, it is by no means regular in its appearance. Found at intervals throughout the year. Odd specimens not seldom swept up; also attracted to carrion.

**Omalium exiguum* Gyll.—In heaps of fermenting grass-mowings; occurs very sparsely, and at somewhat long intervals as a rule; exceptionally, half-a-dozen were taken in two days in April 1946.

Omalium caesum Grav.—Habits as *O. rivulare*, but in general prefers rather drier and less foul conditions; moreover it is never abundant and is often found singly; also by sweeping in warm weather near refuse heaps, and odd examples at roots of herbage.

**Omalium italicum* Bernh.—Scarce, in compost and debris of dead grass from autumn to spring; a fair number on one occasion by sieving humus from the remains of a marrow bed; not seen before 1951.

Omalium excavatum Steph.—A solitary specimen in grass-litter, 17.viii.57, is the only record to date. Considered a common species, but to me it is far from so being.

OXYTELINAE.

Elonius (= *Coprophilus*) *striatulum* F.—In spring or early summer (except once), rare and most irregular in occurrence. A pair from old decaying dahlia roots, April 1933, was the first capture; since when it has been occasionally met with under stones or similar traps in a damp spot near the house (iv.49, 11.x.50, 27.iv.52, iv-v.53—one being found dead). Generally regarded as common, but I do not find it so.

Carpelimus (= *Trogophloeus*) *bilineatus*, Steph.—Very scarce; one swept from grass under apple trees, 28.v.52. I believe that it had also occurred once or twice in earlier years in compost or grass heaps.

**Carpelimus gracilis* Man. (= *tenellus* Er.).—This rare species has been found, singly, twice in the same year, by sweeping: 25.iii.53 (on lawn) and 2.x.53 (near a compost heap, far from where the first was taken).

Aploderus caelatus Grav.—Very uncommon, odd specimens being encountered at intervals by sweeping, in or about grass heaps, etc. (iii.35, 9.v.52, 17.vii.53, 18.ix.54, 12.iii.57).

Oxytelus rugosus F.—Infrequent; first taken 10.vi.52 under fish skin put down as a trap, thereafter occasionally in compost and various refuse, in moist places under stones, etc.; an example of the var. *terrestris* Lac. has been swept from long grass. (This genus is well represented in the garden by ten of our fifteen species; they may occur at any time of year.)

**Oxytelus insecatus* Grav.—Also uncommon, no doubt largely in consequence of its subterranean habits. Found at intervals from about 1950; at roots of grass at the base of a fence, on the wing, by grubbing in a flower-bed, and on damp ground under a piece of board (all single specimens); but more especially under weeds left on paths or bare earth—several having more than once been trapped in this fashion.

Oxytelus laqueatus Marsh.—Of this coprophilous species only one specimen has turned up in the garden, in grass-mulch, 6.vi.51.

Oxytelus sculptus Grav.—Not common, occurs singly or few at a time invariably in heaps of cut grass or compost, rather often in winter; not seen before November 1951.

Oxytelus inustus Grav.—A local species chiefly (in my experience) found by sweeping; the sole example recorded for the garden was taken in this way, 12.v.55.

Oxytelus sculpturatus Grav.—By sweeping over a lawn (three, 4.vi.52), in vegetable refuse, at carrion, and occasionally under stones and such-like cover; not certainly found before 1948, and always sparse and erratic.

Oxytelus nitidulus Grav.—Very rare in the garden, only one having been met with, by sweeping lush grass under apple trees, 27.vi.52.

Oxytelus complanatus Er.—Common and often abundant in all kinds of decomposing vegetable and animal matter; in grass-litter, cat-dung, weed-piles, rotting fish, etc.; sometimes under boards, bricks, etc., in wet and muddy spots, and by sweeping; by far the commonest and most regular of the genus in the garden, where it was first noted in the spring of 1933.

**Oxytelus clypeonitens* Pand.—Of sparing but relatively frequent occurrence in the last decade, occasionally in some numbers; in grass-mowings, debris of straw-litter, old mouldy cabbage stems, etc., sometimes also swept up. The species is considered rare, but I believe it is less so than generally supposed, having taken it in a good many places; it may be overlooked from its likeness to the next.

Oxytelus tetracarinatus Block.—As for *O. complanatus*, but not so generally plentiful as that species, being rather irregular in its appearance; relatively more often taken by sweeping and in flight.

Platystethus arenarius Geof.—Never common, but rather often found in at least the last three years, by single specimens, in wet rotting herbage and beneath stones, etc., in a muddy situation; once shaken from mouldy cabbage stalks and once swept off grass under fruit trees.

STENINAE.

Stenus clavicornis Scop.—Not seen until the autumn of 1954, but since then it has increased and become not very uncommon, though local. In grass-litter, often when comparatively dry, and at roots of herbage, mostly in spring and autumn. Unlikely to have been overlooked previously, and may be regarded as a recent colonist like *Quedius molochinus*.

Stenus nanus Steph.—First found in October 1952, and taken singly or sparingly thereafter at intervals; very local and chiefly in two small widely-separated areas in each of which 4 or 5 specimens have occurred within a fairly short time. Amongst and under debris of leaves, twigs and vegetable rubbish near a wall and a fence, and casual examples sifted out of rotted-down mowings.

Stenus brunnipes Steph.—Very common throughout and at all seasons but particularly in winter, in most kinds of plant refuse, piles of grass-litter, etc.; frequently at roots of herbage, in moss, dead leaves and leaf-mould; also not rarely by sweeping, and even climbing

the house walls. It appears to have become more numerous of late.

Stenus fuscicornis* Er.—A rare species discovered in considerable plenty in rather dry dead herbage in one spot, on a bank in a shrubbery, in early November 1951 (cf. *Ent. mon. Mag.*, 1952, **88: 94), and has continued to occur up to the present time, in varying numbers but sometimes freely between autumn and spring, in the area where it was originally found; also in other parts of the garden but more or less casually, at roots of grass and by general 'grubbing', especially on neglected flower-beds.

Stenus fulvicornis Steph.—Taken twice singly in grass heaps, 19.vi.53 and 10.iv.54; two more by sweeping, 30.viii.58, and yet another swept up on the following day. Possibly in the course of establishing itself. (It is worth noting that although I took a great interest in this genus as early as 1932, no species—not even *brunnipes*—turned up in the garden until much later. If the trend favouring the genus there continues, other species may yet occur—e.g. the common *S. impressus* Germ.)

PAEDERINAE.

Astenus pulchellus Heer.—In contrast to some of the preceding, this normally gregarious species has become steadily rarer since it was first seen about 1934 or '35 in some numbers in cut grass; of late, only odd specimens have been noted (two in 1952 seem to be the last) in vegetable debris. In my experience this, and not *A. longelytratus* Palm (= *angustatus* auct. nec Payk.) is the common species with us.

Rugilus (= *Stiliclus*) *rufipes* Germ.—In cut grass, etc.; hardly uncommon, but not nearly as frequent as the next, being more often found singly, and not so regularly; has occurred in most months.

Rugilus orbiculatus Payk. (= *affinis* Er.).—General and plentiful at most times in similar situations.

Sunius (= *Medon*, part.) *propinquus* Bris.—Occasional at roots of grass, in moss, loam, under pieces of board, once or twice in cut grass or litter; always very sporadic. First recorded in March 1951.

Lithocharis ochracea Grav.—In fermenting grass-mowings, moist litter, straw-debris and rotted-down compost; erratic and as a rule infrequent, but occasionally in small colonies. First noticed in 1936 or thereabouts.

**Lithocharis nigriceps* Kr.—Taken rather freely for a short time at the beginning of March 1957 in the well-rotted remains of a grass heap, and more sparingly at intervals in autumn and spring from then on; one or two in winter (27.i.58). It seems to be ousting *L. ochracea*, at all events the last-named has not been seen since *nigriceps* appeared. This species is an addition to the British list, but an expected one as it has recently been spreading in force into Western Europe from the East; a full account will appear elsewhere.

Lathrobium multipunctum Grav.—At roots of grass and herbage, in turf, under stones, clods, etc.; chiefly spring to autumn; local. Two examples were taken as early as 1928, but the species was for long lost sight of in the garden and only rediscovered in 1951, since when it has been found rather regularly.

(To be continued)

Notes on Microlepidoptera

By H. C. HUGGINS, F.R.E.S.

Eucosma heringiana Jäckh = *rubescana* Huggins nec Constant. The history of this species, whose specific distinctions I was the first to point out, is rather curious and may, I think, now be told without anyone's corns being trodden on.

On 20th June 1922 I took a male flying at late dusk over mixed herbage on the river-wall of the Swale, near Kings-Ferry bridge. I saw at once that I had something new and at the end of the season referred it to my old friend W. G. Sheldon, who took it to Durrant at the Brit. Mus. Durrant at once pronounced it to be a worn specimen of *Lathronympha hypericana* Hüb. This identification was so patently absurd that I sent the moth, a male, to F. N. Pierce, who made a preparation of the genitalia and named it as *E. aspidiscana* Hüb. I was still not satisfied so sent it on to Meyrick, who wrote back confirming Pierce's identification and stated it was the var. *rubescana* of *aspidiscana* described by Constant (*Bull. Soc. ent. Fr.*, 1895, 11). This specimen is still in my possession with Pierce's label "*aspidiscana*" affixed.

The next year I caught another, a female, but then took no more till 1932, when I took a good many. The reason of my previous failures was that I believed in the *aspidiscana* theory and so sought the moth in the daytime and late afternoon when that insect is active, whereas *heringiana* very rarely flies till dusk, when its flight is wild and strong. I wrote a long note to the *Entomologist* (*Ent.*, 66: 88-9) pointing out the differences in habits, time of emergence, habitat, and foodplants from those of typical *aspidiscana*, and stating that but for the lack of structural differences I should have considered it a good species.

In 1933 I came to live in the Southend district and almost immediately discovered the moth at Farling creek, and was again so impressed by its constant differences from the typical race that I sent several to Pierce with a request for further examination. As a result of a careful study he found certain constant differences between the two moths, which he tabulated, on which I described it as a new species under the name of *Catoptria rubescana* Constant (*Ent.*, 67: 169-171). After Meyrick's positive identification of the insect it did not occur to me that there could be any error, and that I had a hitherto undescribed moth. I understand, however, that a comparison has been made between it and Constant's type of *rubescana*, and that they are different, so that my moth has had to be re-named *heringiana*. I presume my original description and figure were quoted.

Of course there were already in existence a good many unrecognised specimens of *heringiana*; I found it in both the Fenn and Harwood collections labelled "*tripoliana* Barrett". It must be remembered that in the years to which I am referring (1922-4) the Tortrix service at the Brit. Mus. was practically nil. It was in Durrant's charge and he was marking time till retirement, failing in eyesight, and quite unreliable. The magnificent service that now exists, with reference if necessary to continental collections, was unhappily in the distant future. Any difficulty therefore had to be referred to outside authorities such as Pierce or Meyrick, and the latter unfortunately let me down more than

once, as in the case of the recently discovered *Laspeyresia prunicorana* Ragonot, of which I referred two specimens to him in 1922.

Crambus salinellus Tutt. In an account of the meeting of the "South London" on 12th September 1957 (*Proc. S. Lond. ent. nat. Hist. Soc.*, 1957: 14) it is stated that Mr. S. Wakely exhibited the above species from Dungeness, Kent, "possibly a new county record". *C. salinellus* has been known as a Kentish species ever since it was differentiated from *C. contaminellus* Hüb. by Tutt.

Barrett (*Lep. Br. Is.*, X, 113) states that it certainly occurs on the coasts of Kent, Sussex, etc., the volume in question being published in 1905. I took it more than once in 1924-26 at Faversham on the small patches of salting on the edge of the creek, but did not trouble to record it as it was well known as a Kentish insect.

In Leech's *British Pyralides* (1886) the moth is still muddled with *contaminellus*, but one of the localities given is Gravesend. This locality referred to the salting on the river side of the wall between Shorne Mead and Cliffe Forts, where *salinellus* and *Malacosoma castrensis* Linn. were formerly common, as Farn told me. When I was a boy this salting had already become too polluted for these two species, though *Scopula emutaria* Hüb. and the ab. *latiorana* Stainton of *Tortrix costana* Fabr. were still common. I have not visited the place for nearly 50 years, but possibly they are still there.

The Klosterfrau

By AN OLD MOTH-HUNTER

"You will get it presently", said the Bishop—

We were sipping our coffee after lunch and I had asked the great Danish lepidopterist to tell me something about the 'Klosterfrau' (as it is called in Germany) or *Panthea coenobita* Esper as it is known to the brethren of the net and sugar-pot. I had heard rumours that this fine moth was spreading westwards, but I was not prepared to hear that it was already so close to our shores.

"It is coming to you", said Dr. Hoffmeyer concluding his account; "you will get it presently".

And indeed it is rather surprising that *P. coenobita* has not yet found its way across the North Sea to those dreary plantations of conifers with which our Forestry Commission is so industriously covering the Breck district. In Europe it was restricted, until quite recent times, to the forests on higher ground, mountain forests for choice, districts where it could find a cold dry continental climate. It occurs in most of the pine forests of Central Europe and ranges from Finland to south-eastern France, but does not seem to be common anywhere, except perhaps in the extensive forests of Germany. In Berce's time it was virtually unknown in France, a single specimen having been taken near Colmar in Alsace in 1868.

It is a handsome moth, about the same size and shape as *Pheosia gnoma* Fab. The forewings, of which the ground colour is white, are heavily marked with irregular dentated black transverse bands and spots; fringes black and white. Hindwings smoky grey, also with black and white fringes; abdomen grey with black bars. Berge stated that

the females sometimes span almost two inches, that it is local in Central Europe, and that it does not occur at all in the north-west.

When the ice melted *coenobita* moved up to the Baltic, then spread into Finland and thence across the Aaland Islands into Sweden, where Aurivillius reported it, in 1888, from Scania, Stockholm and Vermeland, and from here it had already moved across into Norway at Lysaker.

During the last half-century *coenobita* has been spreading slowly westwards. It had long been known in East Prussia and even extended as far west as the eastern parts of Mecklenburg; but south of the Baltic that was the extreme western limit of its range. In 1890, however, it was recorded from Hamburg and nine years later from Lubeck, though it does not seem to have moved up into Holstein for some years. By the time that Lhomme wrote (1923) a specimen had been reported from the Forêt de Raismes in the extreme north of France (Nord), but it was not until 1933 that news came of its presence in Belgium when two specimens were taken on 20th July at La Roche-en-Ardenne. A little later it was recorded from the Netherlands. In 1935 it was discovered to exist at Eupen, twenty-five miles east of Liège. The first two specimens were found on the morning of 26th June sitting on the lamp in the entrance hall of the Eupen Sanatorium, and the following morning another one was found in the same situation. Whereupon Mons. J. Faniel decided to see what the petrol lamp could do and between the 1st and 5th July took nine more. The dates are interesting because May was given previously in most of the books as the time of eclosion. So far as concerns the rest of France *coenobita* occurred only in Isère and the Alps, that is to say east of the Rhone.

Meanwhile the moth was spreading into Denmark. It is believed, says Dr. Hoffmeyer (*De Danske Uglers*, 1949), to have reached that country by two routes, firstly to the Danish islands by way of Sweden and South Norway, and secondly—and much later, the first report being in 1935—into Jutland through North Germany (Holstein). Today *coenobita* is known from several places in North Zealand, from the islands of Moen and Lolland-Falster, and from many places in Bornholm, where it has been taken in some numbers at the Dueodde lighthouse. At present its distribution in Jutland is sparse, but it seems to occur over the whole of east Jutland, the records thence being for 1935, 1938, 1947 and 1948 (six localities).

The larva is handsome and resembles that of a Liparid, being hairy with tufts. Ground-colour brownish-grey with blue intersomital rings and a whitish dorsal stripe intersected by short transverse stripes of the same colour. Spiracular stripe reddish-yellow. It can be beaten out, says Dr. Hoffmeyer, in August and September so presumably it feeds at a height convenient for the lepidopterist. In October a thick cocoon is spun in the ground and the winter is passed in the pupal stage.

Fir is the principal foodplant—Lhomme specifies *Abies excelsa* DC., but doubtless the larva could be reared on any one of the many species of *Abies*. Dr. Hoffmeyer gives "Christmas-tree" and Weimouth fir, where this is available, also larch.

In Central Europe the moth flies in May; in Denmark and Belgium it does not appear until the end of June and, apparently, continues on the wing until July. But the period of eclosion must be spread over a

considerable time as fresh specimens have been found at the end of July and even in August. It comes freely to light and can be found occasionally in the daytime resting rather low down on tree-trunks.

So it is possible that *coenobita* will find its way to those pinetrees on the Breck before many years are past; indeed it would probably have colonised them before now if it could have found a way across the North Sea. For every acre of England that is planted with spruce offers additional territory for *coenobita* to colonise. Happily *coenobita* has shown itself to be a species having a low survival density and in no part of Europe, so far as I have been able to discover, has it ever become a pest. On the contrary it seems always and everywhere to have been reckoned a rather scarce and local species. With *Dendrolimus pini* the case is different and I for one would regard the appearance of the Pine Lappet in our country with grave misgiving. But I should like to see *Panthea coenobita* a member of our fauna; for it is beautiful in both larval and imaginal stages, and there is no reason to suppose that our hymenopterous and dipterous predators would be unable to cope with it.

Its coming into the west may of course be a matter of history repeating. But I doubt if this fine moth ever inhabited the pinewoods of Dogger Land or indeed any part of the extreme north-west corner of Europe when Dogger Land, or the greater part of it, was still above the waters. Had it done so, and the coming of the Atlantic period had proved too much for it, we should have expected it to be an established species on the mainland not so very far to the east of us. But before our present ice age began *P. coenobita* may have laid its eggs on those pine trees which had their roots in soil that we now call England and have been exterminated, farther and farther to the south and east, by the advancing ice. We know so little about the movements of lepidoptera and the causes which bring those movements to pass: not even in the case of our two butterflies, the comma and the white admiral, do we know why, after perhaps a century, they started to spread into habitats previously unknown—unknown to living lepidopterists that is. The westward movement of the klosterfrau may be a movement of this class. But what has caused it to take place?

Collecting Notes

We all want varieties, at least most of us do, whether of stamps or flowers or cats or dogs or birds or butterflies or moths. Perhaps even those who collect—and I don't mean this unpleasantly—lice and fleas want varieties of these, too. I am not so sure about the beetle men and have an idea that abnormal beetles are discouraged by them as being apt to create muddles, just as strange micros sometimes puzzle the micro men. Cattle and farmyard animals are so much tampered with genetically nowadays that varieties are the order of the day and as dear to the stockbreeder as butterfly 'vars' are to the lepidopterist. But this is not to say that all natural 'vars' find favour in the eyes of the farmer. A sheep with two heads, a pig with an additional leg, and a pair of Siamese calves are more likely to provoke cries of rage than of joy.

Where is the line to be drawn between 'varieties' and 'freaks'?

Clearly a distinction must be made since to us fanciers of living things varieties are prized because they yield an unprecedented amount of milk, a fabulous fleece, or a flower eight inches across, whilst freaks are merely obnoxious. A piebald blackbird is one thing, a blackbird with three legs or an abnormal beak quite another. A scarlet stag-beetle would be a prize indeed; one that had a crumpled antler would be simply ridiculous. So it must be a matter of aesthetics or economics. But with us entomologists neither of these considerations would seem to be of any importance at all; some of our most treasured 'vars' are not in the least beautiful; on the contrary, many of them, perhaps most, are asymmetrical and the natural beautiful pattern is sadly marred by the faulty deposition of the pigment. With all but a very small percentage the economic consideration is of no account either. And to the lepidopterist a variation of *structure* is a 'freak'.

This is an important point, for it suggests that the only kind of variation which we entomologists treasure is one of *colour*. A butterfly with two heads and four antennae would hardly be allowed to enter the saleroom, whereas a black *machaon* would command pounds notwithstanding the fact that the double-headed butterfly, with four antennae, was infinitely the rarer of the two. Yet both are natural, that is to say, they are not the products of man's hands; so it is only a convention which requires us to praise the one and spurn the other. We do our best to manufacture vars for our cabinets by breeding genetically; but any teratological results which appear are usually consigned to the dustbin.

When I went collecting butterflies in the 'nineties of last century any specimen I netted of *Lysandra coridon* Poda which had an abnormal underside was allowed to fly away, since it was "an imperfect specimen". Had a friend shown me a drawer of butterflies in which every specimen was a 'var.' I should have regarded him as rather an unhealthy-minded kind of person; for a delight in the abnormal, the macabre, betokened an abnormal mentality. To collect monstrosities (or 'teratological specimens' as the zoologists called them) when normal specimens were to be had was clearly an undesirable trait. Nobody was studying genetics in the 'nineties—indeed I do not think the word 'gene' was known until Johannsen coined it in 1903, and it was not until 1900 that the botanists called attention to Mendel's work.

But the 'craze', as it was called by those who did not indulge in it, of collecting varieties of butterflies and moths was indulged in many decades before Mendel's work began to be studied. Indeed I seem to remember woodcuts of butterfly aberrations in magazines published 'way back in the 'forties. So the reason for this sideline of collecting had nothing to do with genetics: in all likelihood it was due to that strange and universal trait of human nature, the desire to possess something rare, something that nobody else has. It must be very very old, dating perhaps from man's first descent from the trees. What would please Bugg more than a lump of greenstone that fitted comfortably into his palm and had a spike that would pierce the skull of any cave-bear? What could give more pleasure to his descendant John Bugge-Hunter than to know that his fellow spirits were

saying "Of course John Bugge-Hunter's collection is undoubtedly the richest in the country. His 'vars.' are simply marvellous", and so on.

But those happy days are passing, if indeed they have not already passed. Nowadays those of us who take up the collecting of 'vars.' are wise in our generation if we take up the study of genetics as well. For our stock as an entomologist may fall with a crash if we look blank and try to change the subject when a guest points to our latest 'var.' and says: "You bred it yourself? How very interesting! Is it a heterozygous dominant or did it prove to be a simple homozygous recessive? Do tell me all about it. Did you find any evidence of multiple allelomorphism?" Unless we can answer these questions we are in danger indeed; for our silence may be construed as a confession that we collect 'vars.' for the same reason as the stamp collector garners philatelic monstrosities—because they are not properly perforated or have the head facing the wrong way. In other words, we treasure them because they are just 'freaks' . . .

O. M. H.

Current Notes

Last month *The Times* reported the gift to the British Museum (Natural History), by the donor's widow, of the late A. V. Hedges' collection of moths taken and bred in the Isle of Man. "It contains 20,000 specimens", says the report. "the great majority of them bred in captivity by Mr. Hedges with a view to studying variation. . . ." So far so good; but *The Times* goes on to inform us that Mr. Hedges, who "collected intensively" in the Isle of Man, "added many species to the moth fauna of the island". We hope our readers will not take "added many species" to mean that Mr. Hedges "introduced many species" to the fauna of the Island—about the last thing he would have countenanced. What *The Times* meant, of course, was that Mr. Hedges discovered many species hitherto unrecorded in the Island.

The *Canadian Entomologist* has recently published a monograph by A. R. Brooks on the Acridoidea of Southern Alberta, Saskatchewan, and Manitoba. It is a good piece of work, well produced, with distribution maps, plates of genitalia, heads, thoraces, and wings, with, last but not least for junior students, a plate showing the terminology of the exoskeleton. Ecological associations and distributions are given, and the descriptions are adequate yet concise. Intermediates and subspecies are well described.

The *Bull. Soc. ent. Fr.*, 63: 5-6 contains an interesting paper by Mme. G. Guennelon and Mlle. M. J. Tort on the factors which control the hibernating populations of the Tortrix *Archips (Cacoecia) rosana* Linn. in the lower valley of the Rhone. According to these writers there is only one generation a year and the species overwinters in the egg stage. The eggs (which, with the sites of oviposition, are well described) are laid at the end of May, June, and beginning of July, and embryological development continues inside them for several days after they are laid. Development slows down during summer and autumn, accelerating during the winter, and the young larva emerges in March

as the buds of the host-plant expand. During this long egg stage of about nine months various adverse factors come into operation. The authors discuss these factors in detail. Winter temperatures do not, however, appear to affect the eggs at this stage of development, and percentages of the larvae which hatch in spring are given, also the effects of flooding by rivers and streams tributary to the Rhone (which do destroy the eggs), and the actions of predators. These are chiefly an Aearid of the Thrombididae family (*Allothrombium fuliginosum* Kerm. and the Chalcid *Trichogramma cacoecia* March.

The Nature Conservancy's Annual Report for 1957-8 has now been published by H.M. Stationery Office, price 6s. 6d. We have not been favoured with a copy for review, but a circular (which *has* been sent to us for review) describing the Nature Reserves established during the year, does not fill us with much enthusiasm. We learn that 14 new reserves were made, here, there, and everywhere, bringing the total up to 133,081 acres, "nearly three-quarters being in Scotland". We hope the Scots are pleased, but judging by recent periodicals and newspapers sent to us the acquisition of the island of Rhum (to mention one only) has not filled the northerners with delight. To illustrate the value of some of the work being done, "the Conservancy" (so the circular tells us) "have for the first time successfully measured how many voles there are to the acre on plague areas, and what happens following a vole plague". Most schoolboys could answer that one off-hand—buzzards and owls and kestrels and foxes and stoats and weasels and what not. But we seem to remember something about Darwin in this connection. . . . However, that was a good many years ago and there's nothing like starting afresh every now and then.

At a sale of books at Hodgson's auction rooms in Chancery Lane, London, on 18th December last, volumes one to sixteen of Seitz's *Macrolepidoptera*, published at Stuttgart between 1906 and 1933, realised £310.

Notes and Observations

DEPRESSARIA PROSTRATELLA CONSTANT: A FIRST RECORD IN BRITAIN.—On the 31st August 1957 I took my m.v. light to Ashdown Forest. It turned out to be a poor night, but at dusk I caught a *Depressaria* which was flying over the heather. Some months later Mr. S. Wakely saw this moth and said it was not one he knew. He passed it on to Mr. J. D. Bradley who determined it as *Depressaria prostratella* Constant. I am very grateful to both for their work of identification.

On the 15th February 1958 the insect, a female, was exhibited at a South London E. & N.H. Soc. meeting when its continental food plants were discussed. It seemed to Mr. Wakely and myself that as these do not occur in Britain, *Ulex minor*, which is related to them, and which occurs plentifully where the moth was caught, should be searched later in the year for larvae. On the 28th June therefore we spent some time collecting *Depressaria* larvae in spinings on this furze. I returned on the 6th July, and Mr. Wakely and Mr. L. T. Ford made other visits. Unfortunately only *Depressaria umbellana* Steph. emerged from these larvae.

I tried there again on the 19th and 31st August looking over the heather, and running the m.v. light, and although the second date was a good night for moths, history did not repeat itself as far as the wanted insect was concerned.—R. FAIRCLOUGH, Blencathra, Deanoak Lane, Leigh, Surrey. 2.xii.58.

PLUSIA BILOBA STEPH. IN DEVON.—I made my most interesting capture of the year on 1st October when I took in the moth-trap a *Plusia* that I was unable to identify. I am greatly indebted to Dr. C. G. M. de Worms for the interest he has taken in the determination of the species. It is due to him and to Mr. Alan Kennard, who together compared my sketch and description with the *Plusiinae* at the British Museum that I was able to state that it is a nearly perfect specimen of *Plusia biloba* Steph.: the only previous capture of which species, in the present century at any rate, having been made by Mr. Philip M. Miles in West Wales in 1954. His specimen was taken in a moth trap at Trawscoed near Aberystwyth on 19th July of that year and was recorded in *Ent. mon. Mag.*, 91: 89, together with a full account, including the circumstances of its early 19th century naming by Stephens and deletion from the British Catalogue, together with an extract from Holland's *The Moth Book*, 1903, giving the description of the species in the United States of America. An enlarged photograph was also reproduced.



Plusia biloba Steph. × 14. Maidencombe, 1.x.58

One could say that it only remains for me to place on record *P. biloba*'s second appearance, but as the previously published photograph of the species may not readily be available to all our readers, the accompanying illustration will probably be of assistance.

Regarding the original description, I must admit that I am always somewhat baffled by the term "fuscous"; and "purplish" makes one think of *P. pulchrina*. My specimen is a rich bronzy chocolate brown, and the distribution of the dark and light areas suggested *P. iota* rather than *P. gamma* L. to me.

Mr. Miles's specimen was unfortunately so battered that the inverted crescent marking (which I thought in mine more like a golden tadpole) is scarcely visible, and the scaling of the hindwings so deficient that the comparison to *gamma* is not borne out.—FRANK H. LEES, The Gables, Maidencombe, Devon. (*in lit.*, 27.xi.58.)

VANESSA ATALANTA LINN., V. CARDUI LINN. AND NYMPHALIS ANTIOPA LINN. IN IRELAND.—Just after I had returned the press proof of my paper "Migrant Lepidoptera in Co. Dublin, 1958" (*Ent. Rec.*, 70: 250) a report came to hand from Inishtrahull, an island off the north coast of Co. Donegal, to the effect that a considerable invasion of *V. atalanta* and *V. cardui* took place on the 6th and 7th September. 'Hundreds of the butterflies were seen, *cardui* outnumbering *atalanta* by about 10 to 1 (D. J. O'Sullivan). Information, also, is now available from the Saltee Islands, Co. Wexford (Saltee Bird Observatory), where *atalanta* and *cardui* were plentiful during the whole of September; estimated numbers of each species varying from about 25 to about 50 per day. Two examples of *N. antiopa* were seen in Ireland during the first fortnight in September, one in the Saltee Islands, and one on the mainland, near Wexford. The latter specimen was seen on two consecutive days; on one occasion, at rest on a willow bush (D. Webb).—E. S. A. BAYNES, 2 Arkendale Road, Glenageary, Co. Dublin. 20.xii.1958.

HERSE CONVULVULI LINN. IN GLOUCESTERSHIRE.—As there seems to have been very few records of *Herse convulvuli* L. in Britain this year I thought it might be of interest to report that a fine male specimen was brought to me for identification by Mr. J. Harding on 5th October (1958). It was found resting on the pavement in the main street here, apparently having been attracted by the light of a shop window. The perfect condition of the insect, together with the date of its capture, seem to me to indicate that it had recently emerged.—J. NEWTON, 11 Oxlease Close, Tetbury, Glos.

DEUTERONOMOS ALNIARIA LINN. AB. APPROXIMANS IN NORFOLK.—Your note requesting information about aberrations prompts me to think that readers might be interested in an odd form of *Deuteronomos alniaria* L. which I took this year in Norfolk. I was finding a 'thorn' which I could not identify. I took only one specimen, and on my return to London I gave it to Mr. Fletcher at the Natural History Museum. Nothing there could be found to fit it, so the specimen went to Tring, where Mr. Goodson eventually tracked it down as *D. alniaria* L. ab. *approximans*, described by Lempke in *Tijdschr., Ent.*, 1951, 94: 291. The form has the two vertical lines on the forewings drawn in towards one another, but not touching. Aberrations with the lines touching are apparently not uncommon, e.g. ab. *clausa*, ab. *triangularis*, etc.; but until this specimen from Hickling Broad (where it is quite common) was taken no British examples have been recorded. Accordingly the specimen is now in the Rothschild-Cockayne-Kettlewell collection at Tring.—T. N. D. PEET, Monitors Room, Bedford School, Bedford.

SPAELOTIS RAVIDA HÜB IN NORFOLK.—An insect of interest was taken at Hickling in Norfolk this summer, a single specimen of *Spaelotis ravida* Hüb. which is apparently the first record from the Norfolk Broads. Indeed it appears that only one other example has been taken in Norfolk at all since the war.—T. N. D. PEET, Monitors Room, Bedford School, Bedford.

[*S. ravida* Hüb. appears to have been common again this year in East Anglia. In some years it is abundant in Essex.—P.B.M.A.]

NORTHAMPTONSHIRE BUTTERFLIES IN 1958.—After a late start the season was possibly an average one. *Celastrina argiolus* L. and *Colias croceus* Foure. were again absent as they have been for some past seasons, although foodplant is abundant for both species. *Lycaena phlaeas* L. and *Polygonia c-album* L. were scarcer than usual; *Aglais urticae* L. and *Nymphalis io* L. were first noted on 26th April compared with 1st-6th March 1957-6-5. The three common Pierids were plentiful, *P. brassicae* L. being more so than for past seasons; *Anthocharis cardamines* L. and *Strymonidia pruni* L. were in good numbers, a ♀ *S. pruni* showing bleaching was taken, while eggs of *A. cardamines* were plentiful on the flowerheads of *Cardamine pratensis*. An early ♀ *Vanessa cardui* L. was taken on the 11th May by Messrs. Crib and Jarman and shown to Mr. Gent and myself during a very pleasant day at Salcey Woods.

Polyommatus icarus Rott. and *Aricia agestis* Schf. were much below average; *Coenonympha pamphilus* L., *Pararge aegeria* L. (partial third brood), *P. megera* L., *Hamearis lucina* L., *Leptidea sinapis* L. (one brood only), *Pyrgus malvae* L., *Erynnis tages* L. (partial second brood), *Thymelicus lineola* Ochs. and *Ochlodes venata* Br. & Grey were fairly common. *Maniola tithonus* L., *Aphantopus hyperantus* L. and *Maniola jurtina* L. were common and variable, *M. jurtina* ab. *anomata* ♀ and *A. hyperantus* ab. *caeca* ♂ and ♀ were taken.

Barnwell Wold was very good for *Pieris napi* L., but *H. lucina* and *Carterocephalus palaemon* Pall. were absent although plentiful in other localities. *Argynnis euphrosyne* L. was fair, and late ♀♀ of *A. paphia* L. were seen on 17th August. *Apatura iris* L. was watched ovipositing at 4.30 p.m.; fair numbers of eggs were found by collectors from near and far. *Thecla betulae* L., *T. quercus* L., *Callophrys rubi* L., *Strymonidia w-album* Kn. all needed looking for but were present. *N. io* L. was not plentiful but many were found with a blue spot inside each ocellus on the hindwings. *Gonepteryx rhamni* L., *V. cardui* and *V. atalanta* were plentiful from 17th August to 31st of that month, an improvement on past seasons.

Some observation was kept on an enclosed meadow that was fired in early spring. Fair numbers of *M. tithonus*, *A. hyperantus* and the 6-spot burnet were later seen flying; some larvae possibly survived. The last butterfly seen was *Aglais urticae* L. on the 1st November.—JOHN PAYNE, 10 Ranelagh Road, Wellingborough, Northants.

UNUSUAL EMERGENCE OF *PANAXIA DOMINULA* LINN.—In Vol. 67 of the *Entomologist's Record* (pp. 67 and 242) Mr. P. J. Burton described his breeding of a number of *Panaxia dominula* L. in the winter of 1954-5, a most exceptional occurrence, I believe.

On 13th August 1958 I received a number of small *dominula* larvae, kindly sent me by Mr. E. W. Smith of Doncaster: they were from a locality in Berkshire. Towards the end of September, these larvae, following the normal procedure of the species, began to stop feeding and to take up their positions for hibernation. I then noticed that one of them (there were fifty in all) was noticeably larger than the others and had spun a flimsy cocoon. On 11th October it changed into a pupa. I had not observed these larvae closely enough to know whether this one had moulted once more than the others: if it did not, it must have missed two instars. When it spun up it was about the size of a normal

larva in its penultimate instar. I kept the pupa in an unheated room and on 10th November the imago emerged. It was a perfect specimen, but naturally smaller than average size, though larger than I had expected, and had a wing expanse of 43.5 mm., not much more than that of an average sized *Parasemia plantaginis* L.—H. SYMES, 52 Lowther Road, Bournemouth. 14.xi.1958.

BREEDING PAPILIO DARDANUS IN ENGLAND.—Dr. P. M. Sheppard of the Department of Zoology, Liverpool University, and I are breeding *Papilio dardanus* on a large scale partly to elucidate the genetics of the various forms of mimetic and non-mimetic females and partly by means of race crosses, to throw light on the evolution of the mimetic patterns. Until this year, we were dependent on citrus leaves for food plant of the caterpillar, but we have now discovered that it can be fed with much lower mortality on *Choisya ternata* (the Mexican orange plant). This is a hardy evergreen and is not uncommon in big gardens in this country. We are already using all the local supplies that we know of and we should be most grateful if anyone in any other part of the country who has a bush could send us regular supplies of the leaves, once every week or fortnight for the next few months. The leaves travel and keep extremely well in polythene bags. We should be willing to pay postage and supply the bags.—Dr. C. A. CLARKE, High Copse, Thorsway, Caldy, Cheshire.

RHAGIO STRIGOSA MG. (DIPT., RHAGIONIDAE) FEMALE TAKEN IN SURREY.—The earlier captured specimens in Britain of this species were taken at Boxhill, Surrey, in 1954 and 1955. When describing these specimens (1955, *Ent. Rec.*, **67**: 332-3) I added a plea for the capture of a few more specimens, particularly of a female, so that the diagnostic characters could be checked.

I failed to find any specimens when paying visits to the area in 1956 and 1957 in the hope of appreciably extending the known flight period of the adults. As I was away from London in July, I asked Mr. R. W. J. Uffen, who was leading a field meeting of the Entomological section of the London Natural History Society to Boxhill on 19th July, to look for flies resembling *Rhagio scolopacea*, the common Woodcock or Downlooker fly. He reported capturing a female which he has allowed me to see. It is a female *Rhagio strigosa* Mg. and was taken on bramble in woodland.

As in the male, the stigma is isolated, as it is sometimes in *Rhagio scolopacea*. The mesonotum is shining yellow with a narrow brown central stripe, broadening a little to form a spot on the shining yellow scutellum. On either side of the central thoracal stripe there is a broad brown stripe on the rear half of the thorax. The pleurae and coxae are yellow; the legs are similar to those of *R. scolopacea*.

The antennae have the third joint rounded and smaller, or as small as the second joint and as broad as long, whereas in *scolopacea* females the third antennal joint is longer (about twice as long) than the second joint and is pointed.

As suggested in 1955, the size and shape of the third antennal joint thus seems a safe diagnostic character in both sexes.

Mr. Uffen's capture now extends the known flight period by one

day, 19th to 29th July.—L. PARMENTER, 94 Fairlands Avenue, Thornton Heath, Surrey, 5.xi.1958.

A LETTER FROM GHANA.—The mail boat arrived in Takoradi earlier this week and this morning I found the October number of the *Record* in my P.O. Box when I called for the mail.

I have just finished reading your interesting note on the remote possibilities of *Drepana curvatula* Bork. being a resident of the British Isles. I have no observations to add about this species but your remarks about *D. falcataria* Linn. have prompted me to put pen to paper—or, rather, fingers (two!) to keys.

You mention on page 234, that you have no record of *falcataria* flying in the area in question under 400 feet and upwards above the Severn. This statement I think holds fairly well for its haunts up and down the British Isles but it does of course also occur in areas which are at sea level as well. In my "The Lepidoptera of Formby" (p. 25) the text states "Fairly common in birch areas, also feeds on alder". Formby, as you probably know, is all at sea level; there are, in fact, one or two small areas in the district where the level is slightly below sea level. The insect has two areas of density in the locality—firstly near the sea where it is to be found in the alder carrs (the larvae feeding on alder—I have beaten many in my pursuit after *A. leporina* Linn. larvae) and also further inland in a small but well populated (entomologically) birch wood. Here, of course, the larvae feed on birch as the numbers of alder trees are extremely limited.

The above is only of minor note, but as you mentioned that you had not found *falcataria* larvae on alder I thought you may be interested in this observation.

I have had an interesting 16½ months in Ghana and will shortly be shipping my entomological "catch" back to U.K. for identification. I have got about 5000 set insects to go through with the people concerned at the British Museum. Takoradi is a poor station for insects (except the mosquitoes) and I am having a rest from setting. Instead, for the past few weeks I have had quite good sport sea fishing (spinning). Insects have not been entirely forgotten—near me as I type there are two fully grown *D. neri* larvae partaking of their last meal. One is the green form and the other the pink/brown form as shown on Plate 1 of R. South, Vol. 1. It is interesting to note that the brown form only appears to eat the flowers of the Oleander whilst the green one is steadily devouring the willow shaped leaves.—M. J. LEECH. 25.xi.58 (*in lit.*).



In the pink and white

In the world of glass there is no bad weather, however drear the days outside may be, and row by row the tomato plants come dark green and sturdy, an inch taller day by day.

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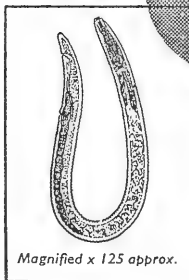
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(Founded by J. W. TUTT on 15th April 1890)

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595.7057

Insects

THE ENTOMOLOGIST'S RECORD

AND JOURNAL OF VARIATION

Edited by S. N. A. JACOBS, F.R.E.S.

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The Mating of Hepialidae (Lep.)

By A. G. CAROLSFELD-KRAUSE

Although I am mostly concerned with matters of classification, my love of biological questions is still alive, and one day I hope to challenge what Seitz says about the mating of *Hepialus* species. In the introduction to the family he states that hepialid males are pursued by the females, but, in the text, this is only mentioned in the case of *H. humuli* L., quoting from a paper by a Mr. Schneider of Posnan. Dr. Imms, 1948, mentions both *H. humuli* and *H. hecta* as acting in this way.

I have examined all the books I have in which *Hepialus* is mentioned, and in those published prior to 1913 it is just mentioned that the females fly extremely little, while books after that date either make no mention of the mating or simply say that the females pursue the males. I have seen many hepialid specimens on the wing during the years, but have never had occasion to think that the females have been pursuing the males, and I have, when I have occasionally run into the matter in literature, wondered whether there can be any real background for the tale, though I have always believed it to be a cock-and-bull story, born not of nature but at the writing-table as a homespun teleological explanation of the white colour of the *humuli* males.

I have seen thousands of *H. hecta* and their matings right from the start, and I have several times observed the mating of *H. humuli*, four times right from the beginning, and in all cases it was the male which was the aggressive party. Imms mentions exactly these two species, I think, because they are "pendulators", which habit also gets a (to my mind wrong) teleological explanation from the mating tale.

Now lepidoptera can act in unusual ways in different places, so I should very much like to know what is thought in England of this mating with the female as the aggressive party.

The first time I ran into the mating of *H. humuli* was in my youth; I was sugaring the trees along the highway west of Roskilde on a rather dark night, and as I was walking from one tree to the next, I suddenly observed an occurrence which made me stop instantly. In the broad shallow ditch by the roadside I saw a most surprising sight, for half a metre above the ground floated a thin white silky carpet, some 2 by 3 metres in extent, gently undulating in the slight wind. The impression was so absolutely supernatural, so ghostlike, that the first thing I did was to say to myself: "Take it easy, there *must* be a natural explanation". And so there was; when I switched my torch on I saw that the carpet was a mass of *H. humuli* males, so close together that they were only able to move up and down; they all had their heads to the wind and were facing a female sitting on a straw. I admired this beautiful sight for some time and then went on to attend to my sugaring, and when I returned to the place about twenty minutes later, all the males but one had disappeared, and the one left was *in copula* with the female on the straw.

I have seen this interesting and very graceful sight on three occasions since; it is certainly not an every-day occurrence, and I think it takes place when the species starts to emerge from the pupae, when

the males appear a little ahead of the females, and all the bachelors dart to the place where the first female is sighted.

Everywhere in literature it states that hepialid species are early dusk fliers, and that they only fly for a short half-hour. This is not the case in Denmark, except possibly in the case of *H. hecta*. *H. fusconebulosus* I have seen but twice, so I cannot say how it acts; *H. humuli* males start a new period of activity after midnight, and I have seen hundreds of males pendulating over the meadows between 24.00 and 02.00, and *H. lupulina* and *H. sylvinus* have come to light here as late as 23.00, and I have netted *H. lupulina* well after midnight.

It may sound incredible, but I estimated the "carpet" described above to contain at least 1,600 males: this estimate was very conservative and in fact the number may have exceeded 2,000. In the three other cases the carpets were much smaller; the smallest was about half a metre square, and contained about 125 or 150 males.

I should be greatly interested to have notes on this subject from readers in Great Britain.

97 Slotsherrens Have, Copenhagen V. 3.i.1959.

Notes on *Hypercallia citrinalis* Scop.

By S. WAKELY

It would be difficult to find a more handsome insect among the microlepidoptera than the above-named species with its bright yellow forewings interlaced with delicate pink lines. It has a wing expanse up to 20 mm. so cannot be referred to as a midget.

Under the older name of *christiarnana* L. it was known in the 1860's both for its rarity and striking appearance. It was recorded chiefly from the Sevenoaks district of Kent—Shoreham and Kemsing being two places specifically mentioned.

After the 1880's there appear to have been no records of its occurrence until 1954, when a specimen was taken at light at the East Malling Research Station.⁽¹⁾ A few years later (1957) two specimens were taken by Mr. M. G. Morris at Wrotham, Kent.⁽²⁾

On the 18th May, 1958, the South London Entomological Society and Kent Field Club had a joint field meeting at Wrotham. Mr. Morris was present and under his guidance a combined search was made for the larvae. From Stainton's notes we knew the larvae fed between united leaves on the common milkwort (*Polygala vulgaris*) and had been found more than once back in the 1860's in Kent.

Luckily for us the milkwort was in flower, otherwise the plant would have been most difficult to find, but it was nearly two hours of combined searching before the first larva was discovered. It was quite small in size, and feeding between two leaves sealed together forming a pod and very similar to the feeding place of the larva of *Phthorimaea fraternella* Dougl. on *Stellaria graminea*. This encouraged the party to redouble their efforts to find more, and soon after another was discovered, this time spun up among the blue flowers. Later on one or two larger ones were found. These were in silken

(1)*The Entomologist*, 88: 63.

(2)*Entomologist's Record*, 70: 5-8.

tubes under a tunnel of leaves spun to the stem. Great care had to be taken to see that these larger larvae did not vacate the spinning before capture, and one at least was lost when this happened. In spite of our combined efforts less than a dozen larvae were found.

According to Stainton, larvae of *Cnephasia virgaureana* Treits. often occur in spinnings on the milkwort, but the few larvae we took all proved to be *citrinalis*.

My larvae were kept in a flat tobacco tin, the foodplant being wrapped in the thin tissue paper which is sold commercially as paper handkerchiefs and which I have found so successful in my rearing of many small species. Fresh food was given at the end of the first week, when I extracted the larvae from the original sprigs and put them on to fresh food. I used a lens to examine the spinnings as two of the larvae were very small and difficult to find. Luckily I wrapped the old foodplant in a clean piece of tissue, which was placed in another tin. Owing to an oversight on my part I did not find this tin until a fortnight later, when some minute grains of excrement denoted there was another larva still feeding. This brought my total larvae up to five.

The tin containing the larvae was kept on end, not lying flat, so that the foodplant would be upright. About a fortnight after being found, one pupated on the side of the tin. It was attached by the 'tail' to a silken pad, and stood out from the tin almost at right angles. It was a bright pea green in colour, with the wing cases slightly bulging outwards from the other part of the pupa. All five larvae pupated in the same unique manner, and the moths emerged from the 15th June to the 1st July. A few days before emergence the pupae showed the bright yellow and pink design of the forewings plainly visible through the pupal skins. It surprises me that the unusual manner of pupation was not mentioned by those who had bred the moth in the 1860's. Mr. Chalmers-Hunt visited the locality at end of June and was lucky enough to take another two moths by walking them up.

Owing to the difficulty of finding the larvae it is doubtful if it will be over-collected by this method. It is probably much more widespread on this range of downs than records would lead one to surmise. Also it seems likely that only a small percentage of the moths in herbage where they occur allow themselves to be walked up.

It might be mentioned that a specimen was taken in Eire (Co. Clare) just before the East Malling specimen, and several others have been taken since in that country.

Nothris congressariella Bruand on Tresco

By ROBIN M. MERE

During a visit to Tresco, Isles of Scilly, from 6th to 16th August 1958, E. C. Pelham-Clinton and I tried to discover something of the life history on Tresco of *Nothris congressariella* Bruand, first discovered in the British Isles on Tresco in 1957.

Lhomme's *Catalogue des Lépidoptères de France et de Belgique*, Vol. 2, page 635, gives May, July, September and October as the months for the imago, and July to September and October to May for the larva. He gives six foodplants including *Scrophularia aquatica*,

S. canina, *S. lucida*, and *Artemisia vulgaris*. So we had plenty of information to work on.

We were fortunate enough to find a larva within an hour of landing on Tresco, and while we found out something of the life history, as appears in the following note, much still requires verification.

The foodplant on Tresco is *Scrophularia scorodonia*, the Balm Leaved Figwort, which is a native of Devonshire and Cornwall and naturalised in Glamorgan. This is not one of the foodplants mentioned by Lhomme.

It is likely that the egg is laid singly near the tip of a young plant. The young larva joins together by a light web the two terminal leaves, face to face, and feeds on the upper surface of the leaf. As the plant grows, the larva leaves its original shelter, and makes a new shelter for itself, normally by curling over the edge of a leaf, rarely by joining two leaves, in both cases with the aid of a light web. As the larva grows it eats through the leaf, making irregular holes between the main veins. It does not eat from the edge of the leaf.

When full grown the larva is half an inch long, rather stout, head small, dark brown, a black plate on the dorsum of the first segment, general colour of larva pale ochreous green, and without any distinctive marking.

The larva leaves the foodplant before pupating, and presumably pupates in or near the surface of the soil. In captivity the pupa was in a thin cocoon made near the edge or surface of the cellulose wool with which the bottom of the larval container was covered to a depth of half an inch.

Although the foodplant grows extensively on Tresco, on waste ground, on sandhills among marram grass, on moorland among bracken, at the side of paths, etc., the larva was not found at all generally, but in limited areas only, and there in general in sunny open positions, such as at the side of a footpath. Sometimes two larvae of different sizes were found on a single stem. The larval shelters are easy to find. We found no foodplant on St. Mary's or Bryher, but have been informed that the foodplant does grow on at least one other island.

About one third of the larvae were parasitized by Hymenoptera, three species being bred.

When the supply of *S. scorodonia* brought home to Surrey failed in September, a two thirds grown larva refused to eat *S. nodosa* and died from starvation.

The pupal period may be about three weeks in nature. Kept in a fairly warm living room the period was 16 to 18 days, the warmth of an airing cupboard reducing the period to 12 to 14 days. The majority of the imagines emerged between 9 p.m. and 11 p.m. B.S.T.

Fresh specimens of *N. congressariella* have been taken on Tresco on 18th and 24th May, early July and the second half of September 1957, an early year, and in 1958, a late year, fairly fresh specimens in mid June. It seems likely that there are three generations a year, as on the Continent, the first end May early June, the second first half of July, and the third September. It is possible that the emergence period is very prolonged, in which case the July insects may be late emergences of the first generation. Both Pelham-Clinton and I regard three generations a year as highly probable.

What we are in doubt about is how the insect passes the winter.

While it must be admitted that no deliberate search was made in September for young soft leaves of *S. scorodonia*, no suitable young leaves were noticed. Hence, if the winter is passed in the larval stage, the larva presumably goes into hibernation without feeding, low down by the base of the stem. Pelham-Clinton has suggested that the imago hibernates, and were it not for the continental life cycle given by Lhomme this would seem likely. Obviously more information is needed before the answer is known, and the problem is likely to be solved if a microlepidopterist spends a complete spring on Tresco.

It would seem worth investigating any *Scrophularia scorodonia* on the mainland to see if *N. congressariella* is breeding there too.

Swarming in Six Species of Empididae (Diptera)

By B. R. LAURENCE

As well as "normal" swarming by male Empididae, which are carrying prey to present to the female during mating, it is possible to find other swarms, consisting principally of the females of some species, or of males which are not carrying prey. The following few observations illustrate the variety of swarming behaviour found in the family. The more normal behaviour is recorded in the first two species, *Rhamphomyia atra* Mg. and *Empis nuntia* Mg., but the other observations show that the swarming behaviour of the Empids may be more complex than has been formerly supposed.

Rhamphomyia atra Mg.

Males of this species were swarming, on 3rd June 1956 at Luton, Beds., on the sheltered side of a hawthorn hedge bordering a lane at the foot of a chalk downland (Warden Hills). A similar swarm was found in the same place on 26th May 1958. The males formed loose aggregations around the tops of the bushes about 8-10 feet above the ground. The flight was a wild backwards and forwards movement. At intervals the males were attracted by females in the swarm, or by one another. Copulating pairs descended regularly from the swarm and, as they descended, attracted other males. The mated pairs often settled in the deepest shade of the hedge, and the male, hanging by his front legs, supported the female whilst she probed her prey. In this position the Empids and their prey could be captured easily.

Males were hunting about one foot above the bare earth and grass of the lane for their prey. This consisted predominantly of the common Mycetophilid genus *Sciara*, 15♂♂, 5♀♀, as well as one male Cecidomyiid and one male Agromyzid. In 1958 a single pair was taken, again with *Sciara*, a male, as prey. This type of behaviour has been recorded before in other species of *Rhamphomyia*, and also in *Empis*.

Empis nuntia Mg.

Swarms of *Empis nuntia*, remarkably similar in appearance to those of *R. atra*, were common in sheltered places along the ridge of the chalk downs (Lilley Hoo), near Luton, during the afternoon of 25th May 1958. The males were dancing in the swarm, again with a wild flight, 5-10 feet above the ground, in the shelter of bushes beside a path. Small swarms formed over a map spread out on the path and, when the map was

moved about a yard, the swarm also moved in the same direction by the same amount. This suggests that the males were orientating to the map as a marker in the same way as Chironomidae and Ceratopogonidae (Downes, J. A., 1955, *Trans. R. ent. Soc. Lond.*, **106**: 213). Copulating pairs descended frequently from the swarms into the shade of the bushes, and the male suspended the female whilst she probed the prey, as in *R. atra*. Some of the pairs landed on horizontal leaves and then remained lying sideways on the leaf. Males were hunting, with their legs extended, near the ground, and quickly began to fly amongst a swarm of *Culicoides* midges, about 3-4 feet above the ground, around the nearest human being. *Culicoides* began to appear as prey soon after collecting had begun and, in the end, formed the bulk of the prey captured: *Culicoides obsoletus* Mg. 29 ♀♀, *Sciara carbonaria* Mg. 1♂, *Sciara* spp. 4♀♀, Cecidomyiidae 2♂♂, 12♀♀, Chironomidae (*Smittia* sp.) 2♂♂, 1♀, 1 gynandromorph, *Microsania* sp. 1♂, Chloropidae 1♂. Although these small Diptera were captured in the air, females outnumbered males by 46♀♀:7♂♂, plus one gynandromorph. Some of the insects were alive and must have been active when given to the female by the male Empid.

On 3rd June 1956 a mixed swarm of *E. nuntia* was observed dancing in the evening (near sunset) 4-7 feet above a cornfield at the foot of the chalk downs in Bedfordshire (Barton Hills), but no prey were found in the net after numerous males and females had been netted from the swarm. It seems possible that the same species of Empid may behave differently at different times of the day.

Hilara flavipes Mg.

Swarming behaviour, similar to that of *E. nuntia* on 3rd June, was shown by *H. flavipes* at Glengariff, County Cork, on 9th September 1956. Males were flying without prey over a mountain path in the shelter of some bushes. The flight was at a height of about six feet off the ground, and was a wild to-and-fro movement. There was no water in the immediate vicinity. Garrett-Jones (1950, *Ent. mon. Mag.*, **86**: 260) suggested that this species does not hunt over water.

The two following species appear to form female swarms, into which the males fly, probably carrying prey.

Hilara nigrina Fall.

A female swarm of this species was found patrolling, in the dappled light beneath some trees, 6-12 feet above a stream, at Eynsford in Kent on 18th July 1956. From the swarm 5♂♂ and 27♀♀ were captured, but the only possible prey found in the net was a mangled plume moth. Males and females were present flying over the surface of the stream below but again no prey were obtained.

Hilara angustifrons Strobl.

Attempts to capture what appeared to be a similar female swarm of *H. angustifrons* on 27th July 1956 yielded 5♂♂ and 17♀♀ and a few mangled aphids. This swarm was flying low, 2-3 feet off the ground, in dappled light over a woodland path at Keston, Kent. The flight was very different from that of *H. nigrina*, as the rather large Empids were flying rapidly backwards and forwards along a definite straight flight line, about 15 feet long, and turning at each end. This flight

was very similar to that of *Rhamphomyia nigripes* Fab. over streams (see 1955, *Ent. mon. Mag.*, **91**: 220). The Empids were flying very fast and low, and were difficult to capture, but one female was captured alone and was definitely carrying out the characteristic movement of the swarm.

Microphorus crassipes Macquart.

No observations appear to have been published on swarming in *Microphorus*. A very dense swarm of this species, extending 60 feet along a hedge, 6 inches to 7 feet off the ground, and extending about 3 feet across a road, consisted only of males. The swarm was present on 10th July 1956 by a small waterfall at Sundon, Beds. The males were almost motionless in mid-air with the conspicuous hind legs hanging down beneath the rest of the body, but no definite mating was observed, although occasionally the males appeared to be attracted to one another. Only two doubtful descents of what may have been mated pairs were seen during a period of more than one hour, but these were not captured. As the wind freshened, or if the sun disappeared behind a cloud, the swarm dwindled, but it was soon formed again. Most of the swarming males floated when they were collected in alcohol and these appeared to have air in the gut. Males and females were common on the leaves of bushes forming the hedge and, as observed before in this locality (1949, *Ent. mon. Mag.*, **84**: 282), some of the females were feeding on the prey (aphids, Cecidomyiids, *Sciara*) captured in spiders' webs. But the females hovering near the webs, or near the bushes, did not appear to attract any of the swarming males. Four of the feeding females were dissected and two certainly had already been fertilised. Strangely enough, these two females, and one other, already contained well developed eggs, so that the protein meal obtained from the spiders' prey was not needed immediately to develop the ovaries. It would be interesting to know how many female Empids require the prey as food before they can lay eggs. This could be followed up by dissecting and examining all female Empids that are captured mating.

Mr. J. E. Collin very kindly has examined specimens of all the species of Empid recorded here and I am greatly in debt to him for his help.

The Coleoptera of a Suburban Garden

6—Brachelytra (Part I)

By A. A. ALLEN, B.Sc., A.R.C.S.

(Continued from Vol. 71, page 20)

XANTHOLININAE

Leptacinus parumpunctatus Gyll.—Very scarce; one, immature, in some well-decayed grass mowings left from the previous year, 30.vi.53; one had occurred much earlier (about the mid-40's?), but neither the beetle nor the record can be traced at present.

Leptacinus sulcifrons Steph. (=linearis Grav.).—In similar situations, also sometimes in comparatively freshly-mown grass, and other vegetable rubbish; moderately common, but irregular; it is gregarious and seldom occurs singly.

Xantholinus fracticornis Müll. (=punctulatus Payk.).—Common as

a rule in compost, rotting cut grass and other herbage at most times of year.

Xantholinus angustatus Steph.—Apparently confused with the preceding up to about the mid-40's, but after that found to be not uncommon with it.

Xantholinus glabratus Grav.—This fine and conspicuous species is not very rare in the garden, occurring at irregular intervals often by odd specimens, but occasionally (x.37, x.44) in some numbers at a time. Similar in habits to the last two species.

Xantholinus linearis Ol.—Very common generally, without being abundant; like the next, in most situations excepting fermenting materials (e.g. under stones, at grass roots, in moss, humus, and litter, among dead leaves and even crawling on doorsteps, walls, etc., in warm weather); can be found any day in the year.

Xantholinus longiventris Heer.—Not much less common than *linearis*, with which it agrees in habits. (These two species are often found together; they differ in behaviour as well as in habitat from the other three, in that the tendency to feign death by rolling up—like the next genus and unlike *Leptacinus*—is much less marked, if it exists at all.)

**Gyrophypnus angustus* Steph. (= *Othius melanocephalus* Grav.).—Local and infrequent; only found from 1951 onwards, quickly attaining its highest incidence in that year and the following, then declining rather steadily, so that very few have been met with in the last three years or so. At roots of grass, especially along the base of a fence; in moss, under stones and rubbish, and once or twice by sweeping; spring to autumn. I have not seen a previous record for the London area, and indeed the species has a strong northerly bias in its British distribution, seeming very local in the south-east.

Gyrophypnus laeviusculus Steph.—Of similar habits and first detected in the garden about the same time, but less local and, in contrast to *G. angustus*, even more common now than formerly though never plentiful. Rather often swept up and more than once on a wall of the house.

STAPHYLININAE

Philonthus intermedius Boisd. & Lac. (Note: the species of this large genus listed here live (in the garden) in rotting vegetable substances, cut grass and compost heaps, unless otherwise indicated, and this is to be understood where biotope is not mentioned. Most can be found in winter but in reduced numbers.) One, 30.vi.53, in very rotten grass-mulch. A dung-dweller which only rarely strays to other habitats.

Philonthus laminatus Ctzr.—Only found at roots of grass and other herbage, like *P. varius* and *fuscipennis*, and not in decaying matter; under chickweed on flower-beds, etc.; quite uncommon and always occurring singly, but seen in most years from 1951 onwards, if not before.

Philonthus politus L. (nec F.; = *aeneus* Rossi).—Common in the larger heaps and where there is plenty of fermentation; also attracted freely to fish put out as bait for carrion beetles; casual specimens sometimes in other situations.

Philonthus succicola Ths. (= *proximus* Fauv.).—A single male from a grass heap in May 1949 is the only record.

Philonthus tenuicornis Muls. & Rey (= *carbonarius* Gyll.).—With *P. politus* and equally common on the whole; more often singly away from the proper habitat than that species. Two females, imprisoned in separate tubes with other beetles, selected as prey the three individuals of *Tachinus* present, these being completely devoured whilst all others were left intact (see *Ent. mon. Mag.*, 1957, 93: 94).

Philonthus fuscipennis Man. (= *politus* F. nec L.).—Frequent at roots of herbage, in moss, turf, etc.; sometimes under rubbish or in grass-litter.

Philonthus varius Gyll.—Under the same conditions but far more local, and only occasionally (as in one spot at the base of a fence after prolonged rain in the spring of 1951, before which it was not found) at all plentiful.

**Philonthus bimaculatus* Grav.—Two were taken running in sunshine on bare soil (perhaps recently dug) in a vegetable plot, near the edge of a lawn, as far back as mid-August 1931. Little if anything is known of the true habitat of this rather rare species, which I have not otherwise met with, but it may possibly be associated somehow with the burrows of earthworms.

Philonthus marginatus F.—A solitary specimen has been taken (7.x.44). Not nearly as common in my experience as usually considered.

Philonthus albipes Grav.—Rare, in late autumn; first in 1952 and occasionally since (e.g. a few in 1955-56).

Philonthus cephalotes Grav.—Of irregular occurrence, but hardly scarce in some seasons, usually with the two following; first noted in 1933. Outside the normal habitat odd examples have occurred in moist places under stones, etc., from time to time, and more often at carrion (fish).

Philonthus fimetarius Grav.—Fairly common, in carrion traps as well as grass and compost heaps, but less so than the next species; has occurred casually by sweeping; first definitely noted about ten years ago.

Philonthus sordidus Grav.—Abundant as a rule under the same conditions; of more regular incidence than most of its allies, so that it can be found at almost any time; seen ever since its habitats were first worked about 1933. Also caught on warm days flying over the heaps and swept off herbage near them. A form with reddish elytra has occurred.

Philonthus concinnus Grav.—Very occasional; April 1933 (one), 5.v.51 (one). Possibly passed over amongst the numbers of commoner species resembling it.

Philonthus debilis Grav.—Only a few examples have been met with at intervals, from 19.vi.51 onwards. A widespread but not usually common species.

Philonthus sanguinolentus Grav.—Four in May 1946 from well-rotted grass which had been mown the previous summer, with few *Xantholinus glabratus*; but I have no other record for the garden.

Philonthus rectangulus Sharp.—Not uncommon at times since 1935 or 36; habitat as given under *P. politus*, but has not been found away

from these surroundings; scarce in the last two seasons. An interesting species which appears to have spread with remarkable rapidity from the Far East over the greater part of the world, reaching this country about 30 years ago; a parallel case to *Lithocharis nigriceps* Kr., already noticed.

Philonthus longicornis Steph.—Tolerably common but not regular; when it does occur a number are generally to be seen. At intervals from 1934.

Philonthus varians Payk.—Found more sparsely than the preceding, often with it but in single specimens, and first noted about the same time.

Philonthus jurgans Tott.—Somewhat more frequent on the whole than *P. varians* but still usually found singly; doubtless confused with the latter up to the mid- or late '40's.

*(*Philonthus agilis* Grav.—The only record is of one from a grass heap with a number of *P. longicornis*, 1934. As, however, the specimen has not survived and cannot be checked, it may really have been *P. jurgans*—not described until three years later—so that the record of *P. agilis* requires confirmation.)

Philonthus discoideus Grav.—Very rare; it occurred once about the mid 40's (date uncertain) and again as a single specimen from a pile of dead grass, 21.ix.57.

Gabrius nigrutilus Grav.—Not uncommon, without being plentiful; habits as *Philonthus fimetarius* and its allies.

Gabrius stipes Sharp.—In like situations; scarce, but very probably often passed over as *G. nigrutilus*; not recognized from the garden till early in the present decade.

Gabrius pennatus Sharp.—Often with one or both of the foregoing, and neither very common nor rare; confounded with *nigrutilus* before the early '50's. All three *Gabrius* also occur at grass roots, in moss, etc.

Ocypus olens Müll.—With this fine species, the familiar 'Devil's Coach-horse', we pass from the smallest to the largest of the sub-family; it is a great rarity in the garden. I have a distinct impression of seeing it there occasionally in the period 1927-30, before I began to keep records; but at all events the sole example met with in recent times turned up under a stone close by the house on the 4th April, 1952.

**Ocypus brunnipes* F.—One specimen by grubbing along the base of a fence, 7.vi.52. I have not otherwise found this uncommon species in the environs of London.

Ocypus ater Grav.—Mainly under flagstones and other cover near the house where the ground is kept moist by drainage and spray from the kitchen outflows, and casually elsewhere in the garden beneath similar cover, July to September; only in 1950 and the few succeeding years, reaching its peak in 1951 and then decreasing; not found in the last 4-5 years. A chiefly coastal species whose inland population is evidently liable to periodic fluctuations.

Ocypus winkleri Bernh.—Apparently rare; one at base of fence under grass, 5.vi.51, and another under refuse on overgrown ground, 6.x.53, are the only undoubted records.

Ocypus siculus Stln.—Also found twice singly: under chickweed on a cinder path, 26.ix.51; at roots of herbage, 18.ix.54. (*O. globulifer*

Geof. has not been found to date, but should occur; *O. aeneocephalus* Deg. might be expected as well.)

Ocypus morsitans Rossi (= *compressus* Marsh.).—Sporadic, under stones, clods, rubbish, vegetation, etc., from 1950 onwards; generally, like the other species, in the latter half of the year, and (but not invariably) by single specimens. (Note: this is another genus which has been far more in evidence in the garden during the present decade than at any earlier time—a fact that cannot, I think, be put down entirely to intensified collecting.)

Ontholestes murinus L.—Two in very putrid liquescent compost, 6.vi.51; one at rotting fish, 27.vii.52.

Creophilus maxillosus L.—Only a solitary specimen so far, under the fish bait when covered with an old pail to keep the rain and cats off, 14.vii.53.

Quedius cruentus Ol.—Very irregular in occurrence, but now definitely established. First noted in June 1953 (one from flowers of *wiegelia*) and thereafter occasionally in vegetable refuse, until a year ago it underwent a sudden increase (3-4 specimens on the collecting-sheet together on one day, but this was exceptional). At least one in winter (27.i.58); mostly in spring and autumn.

Quedius mesomelinus Marsh.—Extremely local, and periodic in incidence; not found in rubbish heaps as it often is elsewhere, all the specimens—I think without exception—having occurred on rather muddy ground, always one at a time, under a piece of board in a damp spot near the house, on various occasions between spring and autumn from 1949 onwards, but not during the last two years.

Quedius cinctus Payk.—In decaying herbage, cut grass, compost; taken sparingly from quite early times, mostly by odd specimens.

Quedius tristis Grav.—Common throughout, at roots of grass, etc., in moss and under stones, bricks, clods, rejectamenta, at most times of year. (The closely similar *Q. curtipennis* Bernh. (= *fuliginosus* auct. nec Grav.), usually considered equally common—a view not shared by the writer—has not been detected up to now.)

Quedius molochinus Grav.—This species suddenly appeared in October 1955, when, and in the next fortnight, several were found; it has continued to occur sparingly up to the present. All the specimens have been in two areas not widely separated. At roots of grass and in the lower layers of damp grass-litter; three on the sheet at once, 23.viii.57; one emerged 9.v.56 from a pupa taken in the former situation a few weeks earlier. The species, like *Stenus clavicornis*, is a clear instance of a recent successful colonist in the garden.

**Quedius obliteratus* Er.—From 11.x.51, when the first occurred, it was found only singly at long intervals; but during the last few years has become much less rare, yet not common, especially in damp litter in spring and autumn; several at once in January, 1958. Also singly at grass roots and under derelict boarding. My other captures of this species have always been near the coast.

Quedius scintillans Grav.—Another and still later newcomer to the garden found at the end of October 1957 in a pile of dead grass and other herbage (three examples on different occasions), and one more in the following January.

Quedius schatzmayri Grid.—Local but not rare, especially in the

period 1950-52; few specimens noted in earlier years, and also latterly. Most have occurred in spring on a short stretch of turf along the base of a fence; found at grass roots and in moss, also under weeds on paths and flower-beds, but not in litter or rotting substances.

Quedius semiobscurus Marsh. (= *rufipes* Grav.).—In similar habitats to the last; local and hardly common, tending to fluctuate in numbers, and not seen (? overlooked) before the early '50's.

Quedius boops Grav.—Under the same conditions as the two preceding, but only occasional. (Tottenham (1948, *Ent. mon. Mag.*, **84**: 253-8) has shown that the *Q. boops* of authors is a complex of closely allied species or forms differing mainly in details of the aedeagus, of which he recognizes five as British. There is, as yet, scarcely enough material from the garden to decide which of these is, or are, represented in its fauna.)

(To be continued.)

An Entomologist in Yugoslavia

By RALPH L. COE

(Continued from Vol. 70, page 266.)

The morning after arriving back at the Croatian capital of Zagreb on my way to the Plitvice Lakes I went by tram to the western suburb of Salata to pay a return visit to Dr. Lorkovic at the Mediciniski Fakultet. When I got there he was busy in his laboratory, and gave me a friendly welcome. He complained of the long spell of wet, sunless weather, which was bad for his experiments in cross-breeding the common white butterflies, as they do not readily mate in such conditions. We had a long talk about my varied experiences since meeting him on my arrival in Yugoslavia some six weeks earlier. When I told him that I was not going on to Plitvice until the following morning and would like to explore the city he said that as he could not accompany me himself he would ask his lady assistant to act as guide. She agreed to his suggestion, and we set off on what proved to be a delightful excursion.

First we went to the Kamenita Vrata (Stone Gate), a relic of olden days. Just inside she showed me a small shrine, blackened by the smoke of candles that have burned there for centuries. Devout people were kneeling in prayer before the pin-points of flame, oblivious to the noise of passing traffic. Little plaques have been set in the walls by worshippers in gratitude for miracles that they claim have answered their prayers. After visiting this place, one cannot credit the prevalent idea that religion is frowned upon by the present regime in Yugoslavia. From there we walked to the street market near the Trg Republike (The Square of the Republic), on the way stopping to admire the imposing exterior of the catholic cathedral of St. Stephen, with its graceful twin spires towering up far above the surrounding buildings. The fine architecture is enhanced by a series of miniature steeples which decorate the bases of the spires.

Soon we reached the bustling market, situated in a wide tree-lined street, a colourful spectacle indeed with the brightly costumed peasant women selling their wares at the numerous stalls. From outlying villages they bring their fruit, vegetables, lace, and all kinds of handi-

work. Quite a number of women had mushrooms for sale. On little trestled tables these delicacies were displayed in considerable variety. The Western dresses of some of the women customers contrasted sharply with the traditional attire of the peasant women. Around their heads the latter wore loosely tied scarves in brilliant colours.

Leaving the market by way of a long flight of steeply descending stone steps we came into the Trg Republike, the main square that is the hub of present-day Zagreb. The blaring of several huge loud-speakers almost deafened me. The same phrases were being monotonously repeated in a nerve-racking manner. My companion told me it was a political broadcast, and that this went on with scarcely a break from morning to night. After lunch in an open-air restaurant, my guide left me and I passed the afternoon in shop-gazing. One thing that impressed me was the high price of clothing. A man's three-piece suit cost about four times as much as one would pay for one of similar quality in England. An ordinary-looking pair of grey flannel trousers was priced at 8400 dinars (£10). I was intrigued to see English papers displayed in a reading-room. The number of Yugoslavs who are studying English is remarkable. Several were standing in front of our papers, more or less laboriously translating the text, with or without the aid of a dictionary.

When I got back to the hotel in the early evening, a large coach bearing the sign, ' Tours', was standing outside. In the foyer were a group of English people. They were on a ten day tour which took them to almost as many European capitals. I spoke to one of the party, a stout middle-aged woman with a Cockney accent. She asked me with much agitation whether it was safe to leave the hotel. Seeing my amusement at her question she went on, "We only got to Yugoslavia this afternoon, and the first time the coach stopped *they* tried to pinch our tyres. I'm scared stiff what will happen next!" I told her that I had travelled widely in the country for the past six weeks, and had never met more honest people anywhere. "In fact", I said, "it was most likely some tourists who tried to remove the tyres." Despite my remarks, I have little doubt that on her return home she gave her friends a wrong idea of the Yugoslavs. The coach party were leaving the following day for the Austrian capital of Vienna.

I set off at 5 o'clock the next morning to catch the 5.30 train to Vrhovine, from where I would go by bus to the Plitvice Lakes. The train actually left at 7.5, although it was in the station when I arrived. But this often happens in Yugoslavia, where one must take the rough with the smooth. On this Sunday morning Zagreb station was crowded with excited people, mostly off for a day in the country. As the train was three hours late in arriving at Vrhovine, it was as well that people were setting off so early for their Sunday outing. The occasional 'brz' or express train is given priority, and slow trains are often shunted on to a siding to allow one of these to pass. Sometimes for no apparent reason our train stopped and the passengers clambered out, some lying down alongside the track and others strolling about. The train would suddenly start moving, but so slowly that people could easily run after it and jump aboard. Whenever we stopped at a station people hurried off to fill bottles with water, which were handed round to one and all when they rejoined the train. Sharing my compartment were a young

couple with two children. As soon as we left Zagreb the parents stretched themselves along the opposite seat, feet to feet, the children snuggling in between them. Thus they remained until their station was reached, alternately sleeping and eating huge salami sandwiches.

The countryside that we passed was dotted with villages, the small houses solidly built of wood, many with a substantial piece of ground, on which were pigs, cows and poultry. Now and then we passed long monotonous stretches of absolutely barren land, with frequent outcrops of rock thrusting up from the ground. By the time Vrhovine was reached, the train was nearly empty, and besides myself only one or two people got off. I had been told at Zagreb that the bus for Plitvice met the train outside the little station. After waiting there for about half an hour, however, there was still no bus in sight. Standing by me was a pathetically frail girl in her early teens who was selling cherries which she carried in a large basket. She was making little spills from newspaper and filling these with the fruit. As I watched her she finished her stock of paper and in dumbshow appealed to me for a further supply. I took from my case a German newspaper that I had bought at Munich on my way from England. Between us we made enough spills to hold the rest of her cherries, and her serious little face relaxed into a smile as we finished the job. By then it was 3 o'clock, and there was still no sign of a bus. I made signs to the cherry seller that I was hungry, and she took me to a small café near the station. While I enjoyed a dish of goulash she kept an eye open for the bus. When I told the proprietor that I wanted to go on to Plitvice, however, he said in Serb that there was no service on Sunday! The next bus would leave at 5.15 the next morning.

I found that the only sleeping accommodation available was at an inn about half a mile off. So I set off wearily with my cases to find it. The landlord was a taciturn man of unprepossessing appearance. He took me upstairs to a poky room, furnished with a small bed, a chair, wash-basin and spittoon. After settling in, I got together some collecting equipment and climbed the railway embankment behind the inn. On the grassy slope were patches of cow parsnip and other Umbelliferae in bloom. From these I collected a nice series of the Tipulid *Nephrotoma flavescens* Linnaeus, a handsome yellow and black species that I had not taken elsewhere in Yugoslavia. I also netted from the blooms a nice selection of other Diptera, including several species of Syrphidae, Tachinidae and Empididae.

Before going to bed I asked the landlord to wake me at 4.15 in the morning. However, the lumpy mattress was so uncomfortable that by 4 o'clock I was out of bed and, stripped to the waist, having as good a wash as the small basin allowed. At the allotted time, a knock came to the door, and, thinking it was the landlord, I threw it open. A buxom young woman was there, however, who at sight of my bare torso let out a piercing scream and rushed downstairs. The queer look that the landlord gave me as I paid my dues made me feel very embarrassed.

When I reached the station, to my relief the bus was waiting there, with some passengers already aboard. I got on, happy to think that we would be on our way at any moment. But the driver seized every pretext to delay the start of the journey, a curious habit that I had

noticed before on country buses in Yugoslavia. He duly revved up the engine, and then started an argument with a woman passenger who claimed that her railway ticket from Zagreb took her to Plitvice, whereas he said that it expired at Vrhovine. The offending ticket was handed round to the other passengers, who took opposing sides until there was a regular uproar going on. The ticket was plainly marked 'Zagreb to Vrhovine', but to admit this at once would have spoilt a beautiful argument. When everyone had had enough of it the woman meekly paid the difference in the fare. We were about to start when another woman got on the bus. The driver shut off the engine and told her the bus was full. While a further argument was in progress, another six people came aboard. Eventually all the surplus passengers stayed on, and we left for Plitvice at 7.45, two and a half hours late.

After a few miles the open countryside gave way to wooded hills, and as we climbed glimpses of the Lakes of Plitvice could be seen in the distance. There are sixteen of these lovely lakes, connected one to another by a series of wild, rushing waterfalls. Each on a different level, the lakes lie in basins of limestone, and the incredibly beautiful shades of blue or green of their still waters have to be seen to be believed. A charming folk-tale relates that after making the world God found a number of small lakes still to be fitted into the Divine pattern and these are the Lakes of Plitvice. Extending over ten miles, they are hemmed in for the most part by densely wooded hills.

The bus pulled up by one of the central lakes at a small restaurant. It stood at the verge of an old forest, birch, oak and beech trees coming down almost to the shore. Close by, several chalets provided simple sleeping quarters for the holiday makers. On enquiring at the reception office I was told by the manager that no accommodation was available. Determined that my long and arduous journey should not have been in vain, I said that 'officials' in Belgrade had assured me that a room would be found for me at Plitvice. An English-speaking lady whom I had met on the bus helped me in my efforts, and when she told the manager on my behalf that I would lodge a complaint in Belgrade he gave in. In one of the chalets I was given a small room, furnished only with the barest necessities for sleeping and washing. But I was thrilled at the prospects of collecting for a whole week in the wonderful surroundings.

After a wash and a meal, I took my net into the forest. The day was cool and showery, and with the undergrowth thoroughly soaked, sweeping was out of the question. But I had a foretaste of the good things to come. As I stood under the dripping trees, a shaft of sunlight burst through, and in a flash a fine yellow-haired Asilid flew down and alighted on the back of my hand, from where it was easily transferred to the killing-bottle. It was a female of *Laphria epphipium* Fabricius, an uncommon species. I passed an hour or so collecting a nice selection of Drosophilidae with my aspirator from bracket fungi on the trunks of birch trees, despite a steady drizzle that was falling. In another short burst of hot sunshine I was delighted to capture a further example of *L. epphipium*, this time a male, as it rested on a small rock. This handsome species did not come my way again during my stay at Plitvice. Wherever I wandered in this fascinating old forest there was the smell of decaying vegetation. Underfoot deep

moss covered treacherous cracks in the partly rocky ground, and many quite large trees were completely rotten. I gave one a slight push and it toppled over. The appalling neglect of many years would no doubt have dismayed a forester, but from an entomologist's point of view nothing could have been so full of promise. An inevitable source of annoyance in such damp surroundings was the biting of midges and mosquitoes that rose from the undergrowth as I moved about.

As I crouched under a fallen tree trunk transferring the contents of my aspirator into a killing-bottle I was startled to hear close by the loud cracking of branches and the sound of heavy bodies pushing through the vegetation. The next moment I was hemmed in by some of the largest pigs that I have ever seen. Snatching up my precious haversack I waved my arms about and to my relief the unwelcome visitors sheered off. This was the first of many such encounters. Not only porkers but herds of cattle roamed about the forest, and I had to be careful not to leave my equipment lying about.

Towards evening I went back to my room to pin my specimens. Outside the small window a beech tree obscured the light even at mid-day, and now the room was quite dark. I turned on the electric light switch but to my annoyance nothing happened. When I complained to the manager he said that the current did not come on until later in the evening. This was only one of many shortcomings at Plitvice. For instance, the guest had to fetch his own water for washing purposes from an outside tap, a bucket being provided for this. It was no joke ploughing through the mud, sometimes in heavy rain.

The next day dawned cold and rainy. I felt really chilled after the heat of Macedonia and put on plenty of extra clothing. Sweeping in the forest proved useless, as my net was quickly soaked and such specimens that I caught were ruined. Fitting on a dry net-bag I concentrated on collecting *Drosophilidae* that were swarming on patches of a yellow fungus that covered the underside of the trunk of a fallen oak tree. By waving the net about close to the fungi large numbers of the flies were taken. It was difficult to prevent pieces of the fungi from falling into the net. When this happened the sticky fragments rolled about and ruined the flies. I took eight species of the genus *Drosophila*, namely *phalerata* Meigen, *kuntzei* Duda, *trivittata* Strobl, *confusa* Staeger, *obscura* Fallen, *subobscura* Collin, *histrion* Meigen, and *testacea* von Roser. In teeming rain I took over four hundred specimens of *Drosophilidae* from this sheltered breeding site. These included a total of seventy-seven of both sexes of *Mycodrosophila poecilogastra* Loew. A pair of *Leiomyza laevigata* Meigen, a handsome little black species of the fungus-breeding family *Asteidae*, completed my 'bag'.

That evening as I sat on the balcony of the restaurant awaiting my supper a three-piece band turned up to entertain the guests. A space was cleared for them in the dining room, and I moved in there to listen to the music while I had my meal. There were two young men instrumentalists and a girl singer, all students earning some money in their vacation. The girl had a lovely voice, and made a charming picture with her corn-coloured hair, blue eyes, and slim figure. She wore a simple circular necked jersey of dark blue with long clinging sleeves.

It was maddening to wake up the next morning to the sound of torrential rain. I had been warned that in this mountain-girt chain of

lakes long periods of rainfall must be expected. Putting on a mackintosh and cap and with sandwiches in my haversack I set off to explore the lakes. As I walked along the shore I was fascinated by the beautiful blue transparency of the water, the whitish limestone bottom far below showing so clearly as to give a deceiving impression of shallowness. Off the opposite shore the background of pine-covered hills was faithfully reflected in the lake. Soon I had reached the point where the waters narrowed and tumbled down in a series of roaring cascades into the next lake. This grand scene of ever-varying waterfalls is repeated as lake spills into lake until the little river Korana which has made this turbulent start from its mountain source flows quietly on its way.

54 Crossways, Addington, Surrey.

(To be continued.)

The Passing of the Lamp

By AN OLD MOTH-HUNTER

Some years ago I queried in this magazine what our lepidopterists would do when their m.v. lamps had filled their cabinets. Nobody had any suggestions to make, at least in these pages—doubtless bearing in mind the saying ‘sufficient unto the day is the evil thereof’; but a week or two ago I was talking to an acquaintance on this very subject, and his remarks were illuminating.

“I don’t do much collecting nowadays,” said he. “Not nearly as much as I used to. In fact I’ve almost given it up. I go out with a net and boxes only on occasional week-ends, when my wife and I have nothing particular to do and she suggests that as it is a fine day we might as well get the car out and go somewhere. So we go to some pretty spot which we’ve been to fifty times before, and I potter about looking at tree-trunks while my wife sits in the car with a girl friend, knitting and chatting till tea’s ready. Occasionally I finger an aspen branch and perhaps find a larva of *T. gothica*, which I box. But after tea I look at it again and say, “Oh hell, I can’t be bothered to go and get food for it every day”; so I tip the wretched thing out of its box on to a small aspen, which it promptly falls through into the grass below. Not feeling very keen on finding more caterpillars I whistle up the dog and see if I can kick up a rabbit for him to chase.

“After all, why should I footle about with say half a dozen larvae of *D. trimacula* in a larva cage, which I have to clean out and fill with fresh foodplant every day, and go to all the trouble of storing their pupae—which will probably dry up in any case—when I can get a dozen fine specimens of the imago with my m.v. in half-an-hour? It just isn’t sense to waste so much time.

“And anyhow my cabinet is already full up and I can’t afford to buy another one. I’ve got all the butterflies I want—I caught 140 *Erebia epiphron* in Scotland only three years ago, and I got so many *M. arion* at Bude before it was made into a reserve that I’ve given about fifty away.”

“So you’re going to give up entomology altogether?” I asked.

“I’m thinking of buying a boat at Burnham and spend the week-ends sailing. My wife’s fond of the sea, too.”

“Have you thought about starting to collect any other Order?”

"Yes, I thought about it; but I don't think I shall. You see, I'm a bit old to start at the foot of the ladder again, and there are thousands of species in some of the Orders—Coleoptera, Diptera, Hymenoptera, and so on."

"How about a smaller Order, say Orthoptera?"

"I don't think grasshoppers are very exciting insects, and they're more grotesque than beautiful. Also one has to go down on one's hands and knees to find them, unless of course you can kick 'em up and net them while they're on the hop. I know nothing at all about their early stages, and besides, I believe there's only about forty of them in this country."

"Dermaptera, then?"

"I hate them—always have hated earwigs ever since a boy at school put one in my bed."

"Why not go back to the Lepidoptera and collect vars? Start with species that vary very greatly, such as Chalkhill Blues or Marsh Fritillaries. Then you would enjoy such hunting as you have never known before."

"That's rather an idea."

"At the same time you could collect series of such Noctuae as *xanthographa* and fill a drawer in which no two specimens were alike. Most of the vars. are named but by no means all; think what fun you could have searching the sugar patches for unnamed vars. which you could describe in the magazines, and name them yourself. You'd get the same thrill from sugaring as you did when you first took it up. Only a year or two ago I saw a drawer at the South London show which contained only an insect at which every collector turns up his nose—*A. monoglypha*. The specimens in that drawer ranged from black as coal to the palest of grey and were arranged in perfect gradation of tint. I thought the man who collected those moths was a real entomologist. Why not copy him?"

"Look here, if you go on like this I shall have to give up the idea of that boat at Burnham. But I should have to buy another cabinet, and I can't do that."

"Wouldn't cost anything like as much as a boat, would it?"

"No, I don't suppose it would. But there's no room in the house for another cabinet."

"Where there's a will there's a way. There's a sale of cabinets in London next week. Come and lunch with me and we'll have a look at them afterwards."

"Would you give me a hand at first?"

"Of course I would. We'll go to Tring and you shall see such vars. of every British moth and butterfly as will make you goggle."

"Sounds quite exciting. All right, I'll think it over. But we must have a day at Tring anyway."

"It is exciting. And I believe a good lepidopterist is going to be saved from . . ."

"The sea?"

"No. The m.v. . . ."

Lt. Col. H. Bridges' paper on Butterflies of the Valais District has been unavoidably held over until March.

Notes on the Microlepidoptera

By H. C. HUGGINS, F.R.E.S.

SOME TORTRIX PROBLEMS

Pammene argyrana Hüb. This moth appears to be a composite species, and one of its constituents deserves investigation. Barrett (*Lep. Br. Is.*, xi, 180-181) describes the larva as feeding in young oak-galls and also, on the authority of Dr. J. H. Wood, on the leaves of apple; but he points out that it refuses to eat oak leaves. He also states that in some districts the moth is found in plenty on the trunks of apple trees.

When I lived near Sittingbourne, Kent, in the heart of the orchard country I found a moth I put down to this insect flying freely in the late afternoon over the tops of apple trees in an old orchard at Bredgar. After waiting a little while I succeeded in catching one, but as I was in a hurry and the moths were flying high I then went on, intending to try again at some future date. The moth I took was a female and I still have it, and it differs from the usual run of *argyrana* in being entirely dull black except for the dorsal blotch and a few costal streaks. I referred it to Meyrick in the autumn, who confirmed it as *argyrana*, and as I left the district before the next season I went no further into the question. I did note, however, that the other *argyrana* in the district were the usual mottled form and that they appeared on the wing three weeks before this apple insect. I have never since seen any like it, although *argyrana* the oak insect is common here and occasionally produces an almost white aberration; but Mr. J. D. Bradley recently pointed out another in the Doubleday collection. I think it would be worth while for any collector within easy reach of Kentish orchards to try to obtain a quantity of this insect for investigation; shortly afterwards in the year he might possibly get *L. prunivorana* Ragonot. My only doubt about his luck is concerning how far spraying and pruning have altered these orchards.

Hemimene senectana Guen. This is a moth of which I have little personal experience and most people appear to have less. The only place in which I have ever found it was at the foot of the cliffs between Seaton and Beer, in Devon, at the end of May, flitting over the rough herbage. The only other collector I know who took it was the late Rev. J. W. Metcalfe, who also found it at the foot of the cliffs between Beer and Branscombe. Nothing whatever seems to be known of its life-history. Should this be discovered it ought to be easy to get, where found, as most of the group are not difficult to breed. Barrett (*ib.*, xi, 259-260) points out its liking for undercliffs and gives a number of localities, but I have heard of no recent records, though I have no doubt there are plenty to be had for the looking on the South Coast.

Current Notes

This is an unpleasant time of the year for those of us who conduct this magazine for you. Not only do we have to spend much time in casting up accounts, watching the pennies, and estimating how many pages we can give you each month during 1959, but we are devoting

hours to writing letters to subscribers who do not pay their subscriptions promptly or who, having sent us only 20s. for their subs last year, ignore all appeals to send us the extra five shillings which they owe the magazine and thereby enable us to 'close our books' for 1958. Can you who support us so loyally and promptly be surprised if we sometimes say to ourselves, "Is it really worth while carrying on?" Some of us have no leisure at all; for running a monthly magazine is really a whole-time job; we get no thanks (and don't ask for any), and every now and then comes a letter criticising adversely what our own contributors have so generously sent us. The editor who can please all his readers all the time has not yet been born, and never will be.

So it was with not a little pleasure that on New Year's Day we received a letter from one of our stalwarts who, in sending his cheque for 1959, wrote: "I entirely agree with the changes instituted regarding payment of subscriptions. Those who cannot remember to pay subscriptions when due do not deserve to receive this excellent little journal, the cost of which is only maintained at so low a figure by the hard work given freely by its officers."

It is letters such as this which not only 'sweeten labour' but encourage us to do our level best for the magazine. But what about our Contributors? They too are with us when any praise is accorded to the *Record*. It is they who supply us with the material of which the *Record* is composed. But for their ready and generous and constant help the magazine could not exist for a month. And how about our printers? Can you imagine yourself, if knowing nothing at all about insects, typing out on a linotype machine, line after line containing such words as *Gastrancistrus tenebricosus* or *Euamblymerus tenuicornis* without ever making a mistake? Yet our printers do this month after month, year after year.* All praise and thanks are due to them too.

What moral can we draw from all this? Surely that it behoves each one of us to support our own magazine to the best of our abilities. If any who read these lines have not yet sent in their subscriptions, please do so TO-DAY. And if those who exercise their cherished right to grouse when the *Record* doesn't contain as much about the particular Order in which they are interested as they would like, and say to a friend: "I thought the *Record* was awfully poor last month", will they add as an afterthought, "which, I suppose, was partly my own fault: I ought to have sent in an account of that day I had in Pinch-me-near Forest, or about that *iris* which settled on the radiator of my car outside the Cat and Custard-pot, where it hasn't been seen for a generation or more . . . After all, the Editor has to rely on us for material for his pages . . ."

If we all take that line there won't be much to complain about in future.

*In a 32-page issue of the *Record* there are 1,664 lines. Such misprints as occasionally occur are in nearly all cases due to typists' errors in the typescript.

Field Notes

Perhaps in years to come our scientists will provide us with an instrument which will chart for us the microclimate of any given area

of a terrain. At present all that we know about microclimates is founded on deductions made from records of temperature, humidity and aridity, light, shade, herbage, dominants, altitude, subsoil, geological formation of underlying rocks, prevalence of winds and thunderstorms and rain, woodlands, heaths, hills, neighbouring water, and so on—a cumbrous and usually inaccurate process of which the overall error is the sum of the small inaccuracies of each record or observation.

The result of this 'fumbling' with scientific data is that at present we are unable to say why a certain area identical, so far as our observations and records go, with another not far away is incapable of becoming the habitat of an insect that flourishes in the one and not in the other. The biotic factor of each area can be ascertained with some degree of accuracy. So if the biotic and physical factors of each are known and are, roughly, the same, we are drawn to the conclusion that the difference between the two areas can only be a climatic one. Probably this is correct. But as to what constitutes the climatic factor of either we have not the least idea. Nor, so far, have we any means of discovering.

A good many lepidopterists have tried the experiment of "turning down" a number of specimens of a lepidopteron in a place where it has not previously been known to occur. What percentage of success has been achieved in these experiments? It must be very small. The Heath fritillary (*athalia*) was successfully introduced into a wood near Southend, Essex; the Glanville fritillary (*cinxia*) to a spot near Sway, in Hampshire; and there may be several others which I have forgotten. But, I repeat, in comparison with the enormous number of attempts (over, perhaps, two hundred and more years) the successes have been exceedingly few.

A friend moved, in early autumn, several 'nests' of larvae of the Marsh fritillary (*aurinia*) from a colony threatened with extinction by the ploughing up of its foodplant, to a similar spot a quarter of a mile away, where scabious grew in plenty. Not a single butterfly was seen next year. And the Marsh fritillary is well known as a butterfly which is constantly "trying out" new habitats. I remember telling Castle Russell about this experiment. He looked grave and sympathetic. "Yes", he said, "I've done this scores of times and never once have I succeeded in establishing a *permanent* colony of *aurinia* anywhere. I have put them down with very great care in spots where the flora of upper and lower herb layers were identical with habitats wherein *aurinia* flourished for season after season within a mile or two away; but never have the progeny of nests which I have put down lasted for more than two seasons at most. I can't tell you why it is, but there it is." A few days after this conversation we were walking along a woodland lane in Surrey when a brown butterfly came flying headlong towards us, travelling fast. I netted it as it raced by. It was a female *aurinia*, a gravid female, for I reared progeny from its eggs. "The nearest colony is about two miles from here," said C.R. Said I: "I think she meant business, going that pace into the blue." "So do I," said my host.

Frohawk often (so he told us) tried to introduce the white admiral (*camilla*) into woods where it was unknown, and never once did he succeed. There are two neighbouring woods, about three or four hundred yards apart, known to me in East Anglia, in one of which the silver-washed fritillary, *A. paphia*, abounds; in the other there are none. One of the woods is on a slight slope, from 10 to 12 feet higher than the other. The herbage in both appears to be the same; both woods were planted at the same time, about 150 years ago. The oak trees are equally spread in both woods; in fact every feature, except for the slight difference in altitude, seems to be common to the two. Why, then, does *paphia* hold to the one and eschew the other?

Both these woods were given over to the rearing of pheasants in the reign of Edward VII, when the 'battue' was so popular, days when a bag of 4,000 pheasants was usual on the opening day of the season. The birds have been reared in them ever since, though of course in very much smaller numbers nowadays. In spring the fields on the south of each wood are occupied by coops, and as the poults increase in size they take to foraging inside the woods. A learned friend at once attributed the absence of *paphia* in the lower wood to the pheasants; but another equally learned friend suggested that a pheasant would not eat a spiky larva such as *paphia*. So neither could solve the problem why *paphia* occurred in abundance in one wood and was absent from the other.

I have noticed that in the lower wood there is a Tabanid fly which looks to me (who am not a dipterist) similar to the fly which favours *M. aurinia* as a host. In the upper wood, but not in the lower one, there is a robber-fly, an Asilid, which may (I repeat that I am not a dipterist) prey on the Tabanids and thus rid the *paphia* of their parasites. To me the interesting thing is that, in this wood at least, *paphia* and pheasants do well together. Perhaps the reason is quite a simple one. In the summer, while the *paphia* larvae are growing up, the pheasant poults are *outside* the wood; when they enter the wood the *paphia* are on the wing. But I feel that without the robber-fly, or some other predator, the Tabanids would have it all their own way, as in the lower wood.

And where does microclimate come in? I should say that some physical feature, unknown to me but possibly connected with dryness owing to the slightly greater altitude of the upper wood, prevents the robber flies from inhabiting the lower wood. Or it may be that the microclimate of the higher wood, though it be so near to, and at so slight an altitude higher, debars the Tabanids from flourishing in it despite the abundance of hosts. The woods are so near together that females of *paphia* and Tabanid and Asilid must cross from one wood to the other every year. It is an interesting problem and I should welcome comments from dipterists.

Notes and Observations

A HABIT OF *MACROGLOSSUM STELLATARUM* L.—I was extremely interested to read your account of *Macroglossum stellatarum* L. showing interest in sun-baked rocks in the Pyrenees (*Ent. Rec.*, 70: 203)

as I have often seen them here behaving in the same manner, usually on hot or very hot days; the walls are as dry as bone so I wonder what they can be trying to get at! On grey days, or when the walls are wet, the moths seem to have no interest in them.—VERA MUSPRATT, Aicé Choko, St. Jean-de-Luz. 6.xi.1958 (*in litt.*).

EUPITHECIA VALERIANATA HÜB. IN KENT.—On 22nd July and 2nd August 1958, near Ashford, I collected some flower-heads of *Valeriana officinalis* into a bag, and upon examining them later found I had about a dozen larvae of *E. valerianata*. This is the first confirmed occurrence of *valerianata* in Kent. But I have little doubt that the species has been overlooked in the past and that it may be found elsewhere in the county among *V. officinalis*, possibly also upon *V. dioica*, which is a locally common plant in Kent, though less frequent than *V. officinalis*.—J. M. CHALMERS-HUNT, 70 Chestnut Avenue, West Wickham, Kent.

HAPALOTIS VENUSTULA HÜB. IN KENT.—P. Cue took a single specimen of this very local moth in his garden at Ashford on 5th July 1958. It is questionable whether *H. venustula* is a breeding species in Kent. The moth has been observed previously on only two occasions: R. C. Edwards took one at electric light at his house at Westerham in June 1937 and W. B. L. Manley took one from the m.v. light-trap in his garden at Otford on 6th July 1956.—J. M. CHALMERS-HUNT, 70 Chestnut Avenue, West Wickham, Kent.

HYPERCALLIA CITRINALIS SCOP. (CHRISTIERNANA LINN.) IN KENT.—I was delighted to find the larva of *H. citrinalis* on 18th May 1958 on the downs above Wrotham, at the same place where Morris took his two moths in 1957. It was feeding on a flower-bud of milkwort and continued to feed on the flowers until full grown, when it changed into the most remarkable apple-green pupa, in shape somewhat reminiscent of that of a butterfly's, but of course without the girdle. It was attached by the cremaster to the side of the glass tube, from which it projected at an angle of about 45°.

On 29th June I was so fortunate as to take a couple of imagines of *citrinalis* on the same ground. They start up from the short turf and alight very suddenly after flying for only a short distance; and it is not until the moth is at rest that it is at once recognisable by the chrome yellow forewing with its intricate carmine pattern.—J. M. CHALMERS-HUNT, 70 Chestnut Avenue, West Wickham, Kent.

[*Presumably head downwards, if there was no girdle.—ED.]

COLLECTING IN 1958 IN LINCOLNSHIRE.—The first butterfly this year was a *Pieris* flying at Fiskerton on 21st April. One *Pararge aegeria* L. was seen in Gautby churchyard on 25th May and next day proved a good day for collecting in the nearby woods. *Pyrgus malvae* L. and *Erynnis tages* L. were both flying, and the first *Euchloe cardamines* L. was seen. I caught one *Brenthis euphrosyne* L. which had just emerged and was in mint condition, though perhaps the word "mint" should be reserved for coinage! Canon Houlden of Lincoln said that *Curterocephalus paluemon* Pall. was to be found in Skellingthorpe wood on this same day.

I have previously reported seeing *Pyrameis cardui* L. in Lincoln on 27th May, and the first one I saw in my parishes was at Minting on 13th June, and, as it happened, I did not see any more. One *Macroglossum stellatarum* L. was seen at Gauthby on 16th June, and on 10th July I was glad to see a few *Limenitis camilla* L. in the nearby woods. *Coenonympha pamphilus* L., *Aphantopus hyperantus* L. and *Maniola jurtina* L. were very common and I saw one or two *Thymelicus sylvestris* Poda.

On 19th July we went to Ancaster to see whether *Strymonidia v-album* Kn. was to be found, but we had no luck, though *T. sylvestris* and *Ochlodes venata* Br. & Grey were plentiful. On 21st August I was surprised to see *Vanessa io* L. and *Aglais urticae* L. hibernating on the ceiling over our back stairs.—THE REV. PETER HAWKER, Gauthby Rectory, Lincoln. 28.xii.1958.

PTYCHOLOMOIDES AERIFERANA H.-S. IN NORTH WEST SURREY.—On the night of 6th/7th July 1958 I found a female of this beautiful Tortrix in my light trap here. First noticed in Kent and Norfolk in 1951, this species seems to be spreading rapidly. Besides other records from Kent, Mr. J. L. Messenger and I found it commonly among old larch at Betteshanger, in the most easterly wood in Kent, on the same date in 1957; and it has been taken at Balcombe in Sussex and by Mr. Mere further south in Surrey. Its appearance at Ottershaw is particularly interesting because there are no larch trees within a mile and very few anywhere in the district. Unless my specimen was a wanderer—and its perfect condition is against this—it looks as if the species may have an alternative food-plant.—R. F. BRETHERTON, Ottershaw, Surrey. 26.xii.58.

RHODOMETRA SACRARIA LINN. IN NORTH WEST SURREY.—A small male of this species, of the ordinary pink-striped form, was found in my light-trap here on the night of 29th/30th August 1958.—R. F. BRETHERTON, Ottershaw, Surrey. 26.xii.58.

PHYMATODES TESTACEUS LINN. (COL.) IN CUMBERLAND.—In December 1958 a specimen of the longhorn beetle *Phymatodes testaceus* L., with two living larvae, was brought to me from a Penrith joiner's workshop. The beetle was taken from oaks felled locally and there appears to be no reason to doubt its authenticity as a Cumberland specimen. There is no previous record from the county.—W. F. DAVIDSON, 9 Castlegate, Penrith. 1.i.1959.

THE SCORPION FLY BOREUS HYEMALIS LINN. IN CUMBERLAND.—In December 1958 I gathered a small sack of moss from a very restricted area in Galt woods, near Brampton, Cumberland, and from this I took five specimens (both sexes) of the scorpion fly *Boreus hyemalis* L. This suggests that the insect is very common at that locality. I found a further pair in similar circumstances in Glencoyne wood, Westmorland, also in December.—W. F. DAVIDSON, 9 Castlegate, Penrith. 1.i.1959.

HABITS OF *APATELE ALNI* LINN.: IS IT A TREE-TOP DWELLER?—Mr. Allan's remarks in the October number last year (*Ent. Rec.*, 70: 242) stir my conscience. Every time I read my *Record* I am thankful to all those who produce such readable matter, and sometimes feel I could add something myself. However, between "feeling" and putting pen to paper is a great gulf over which I never seem to pass. I wonder whether the collectors of the 'nineties had more leisure; or do we of today merely *think* we are busy? Some of us, having gone forth on expeditions, put out our traps, fed our larvae, or made our own records, never finish off the job. I have intended writing the results of four, then five, six, now seven years of using m.v. light in my garden. I love to read of *atropos* here, *ni* there, *sacrararia* everywhere, but content myself when migrants come my way by telling my friends of the captures.

I must do something about this failure to pass on information, and here to begin, Mr. Allan, is my theory about *Apatele alni* L. The moth must be a tree-top dweller, laying its eggs out of reach of human eyes, only the odd wandering larva coming within striking distance of the beater's stick. My evidence is slender. The moth usually appears on the sheet as if it had come down by lift, and not travelled along the ride. On one occasion I brought home six *alni* and released them the next day one at a time. Every one flew up to a great height, which is unlike the usual behaviour of night-flying moths released in daylight. If anyone has any better idea let him set it forth.—R. FAIRCLOUGH, Blencathra, Deanoak Lane, Leigh, Dorking, Surrey.

[While I have had no experience with *A. alni*, the behaviour described at the sheet is almost exactly that of *Nephopteryx similella* Zinck., which, until the m.v. trap came on the scene, was considered a great rarity. It just appears on the sheet; no one sees its coming, one moment there is a bare patch on the sheet, the next, there is *similella*. The view that this is a tree-top species is widely held; its reprehensible habit of keeping late, or rather early, hours may have something to do with the few pre-m.v. captures, but has no bearing on the tree-top idea, which is accepted without any quibble.—ED.]

[Much obliged to MR. FAIRCLOUGH, and I hope that since he has now jumped successfully the 'great gulf' (which isn't nearly as formidable as it looks) he will contribute regularly to our pages. The answer to his query whether collectors of the 'nineties had more leisure than we have today is that the typewriter was unknown in most City offices, and consequently men in all walks of life had to write letters with their pens; so they became accustomed to writing, and writing good, interesting, and long letters; and with experience came the faculty of writing clearly and concisely. Hours in City offices were much longer, and there were no Saturday mornings 'off'.

It is a good thing to remember that although many learned men may have written about the subject on which we propose to write, *not one of them has had our precise experience*. Our *personal* experiences belong to us and to nobody else, and nobody can record them for us as *accurately* as we can. As we write, the scene is before our eyes; not so with somebody else who is writing for us. What a difference it would make to the *Record* if all those who find, like Mr. Fair-

clough *did* (for he has made an excellent start), that the gulf isn't nearly so difficult to negotiate as it looks, would get into the habit of recording their personal experiences for the benefit of other readers of this magazine!

In the matter of *A. alni* I think there is little doubt Mr. Fairclough is right. I once propounded this problem to the late Dr. E. A. Cockayne. He replied: "The moth lays its eggs at the top of a tree, and the larvae don't descend lower than is necessary to find a piece of branch soft enough to bore into. The moths live at the tops of the trees and, like *Gortyna flavago*, are not much interested in paraffin light or sugar". Those were not his actual words, but they are as near as I remember them.—P.B.M.A.]

Current Literature

Under the somewhat journalistic title of "Rainbow Realm of Tropic Insects" some interesting coloured pictures of the Brazilian jungle and some of its insects appear in *Life International* of 24th November 1958.

This records an expedition in which Dr. Kettlewell took part, to follow as nearly as possible the route taken by Darwin in 1832, and although the letterpress is condensed for popular consumption, Dr. Kettlewell has produced some very interesting lights on the subject of the survival of the insects best suited to the environment.

Two large plates drawn by the Swiss artist Walter Linsenmaier show, with some skill, many jungle insects well known to entomologists from museum and "curio" specimens, in their jungle surroundings, and their shapes and markings can be seen being put to their natural uses, and the specimens are the subject of marginal descriptions in simple language.

There are also colour photographs of parasol and migratory ants, an encounter between a spider and a solitary wasp, and several of striking lepidoptera and a few of other orders, showing characteristic attitudes adopted to aid concealment.

The great grief to entomologists will be the thought that while this lavish colour work can be provided for a popular article which will be difficult to preserve on account of the poor quality of the paper, and the large size, it would be utterly impossible to produce this material to illustrate a scientific paper to be preserved through the ages.

Finally there is a full page half-tone picture of our friend, complete with net and m.v. trap surrounded by lepidoptera but wearing something a little less than academic dress.

S. N. A. J.

The *Proceedings and Transactions* of the South London Entomological and Natural History Society for 1957 appeared in October 1958, with xli + 147 pp. + 8 plates, including three in colour, 22/6. The two items of widest interest will be a further part of Mr. Haggett's coloured drawings of larvae of British lepidoptera not figured by Buckler, accompanied by full descriptions. The species illustrated on two plates are *Cosmia pyralina* Schiff., *Plusia ni* Hb., *Plusia chryson* Esp. and *Polychresia moneta* F.; the other item is a study of the British Eriocraniidae and Micropterygidae (Lep.) by J. Heath, illustrated in colour by D. C. Twinn, and describing all species with keys, and 15

figures of the 14 species. This is a valuable addition to the material being collected by the society for publication as a new book on the Tineina, etc.

There is a detailed account of all material exhibited at the annual exhibition with 14 half-tone illustrations of outstanding varieties of lepidoptera.

The presidential address by Dr. B. P. Moore is on the Systematic Position of the tiger beetles, and Dr. H. B. Williams has a paper on the variation of *Euchloe cardamines* with a half-tone plate. M. Niblett publishes two papers on Trypetid and Cynipid galls respectively, and Dennis Leston a paper on Unisexual Dimorphism in a Mirid (Hem.) *Blepharidopterus angulatus* Fallen.

We have received an interesting separate from A. G. Carolsfeld-Krausé from *Entomologisk Meddelelser*, XXVIII (1958), pp. 219-223. This is in English and is entitled "*Etainia sericopeza* Zell. (Lep. Nept.) a brief outline of its biology", and it is the result of close observation of this species in the Botanic garden of Copenhagen over a considerable period, describing a different life cycle for each of the three generations occurring in Denmark.

Among separates sent by Prof. Eugene Monroe are several from the *Canadian Entomologist*, comprising papers from his monumental survey of the Pyralidina, and also a catalogue of Snellen's Types of Pyralidae with Selections of Lectotypes, from Nederlandsche Entomologische Vereening, *Tijdschrift voor Entomologie*, Vol. 101, Pt. 2, p. 65-88 (10.vii.1958).

A separate from Umberto Parenti from *Memorie della Societa Entomologica Italiana* describes *Leucoptera aprutiella*, feeding on *Genista germanica* L. as a new species.

Dr. Dalibor Povolny provides a paper on *Phthorimaea operculella* Zell., the "potato moth", from *Zoologicke Listy, Folia Zoologica*, 1958, in the Czech language. He also provides a paper in the English language on High Mountain Geometridae of the Genus *Psodos* Treits., read at the XVth congress of Zoology, Sect. II, Paper 17. Also a third paper from *Acta Musei Moraviae* in Czech on *Cledobia bombycalis* Schiff., and *Depressaria cervicella* H.-S. with genitalia dissections.

S. N. A. J.

Obituary

The sudden death of John Christopher Beadnell Craske on 5th December 1958 came as a great shock to his many friends and fellow-collectors.

Born in 1902, the eldest son of the late Colonel John Craske, C.M.G., D.S.O., he began collecting moths and butterflies from an early age in Ireland, and later in Bedfordshire. After seven years' tea planting in South India he returned to England, and with his brother Robert commenced in 1932 a collecting partnership which lasted most happily until his death.

From 1933 onwards the partnership concentrated on butterflies and their varieties. To this both brothers brought remarkable powers of observation, and appreciation of habitats, qualities inherited from their father, a keen collector in the period 1880 to 1895, and their grandmother, who also collected, and their great-grandfather, John Beadnell, whose representative collection of lepidoptera from Epping Forest and the Fens, from the period 1840 to 1865, included several *Lycaena dispar* and a number of moths now extinct in England.

Jack Craske's individual successes in the field were many and varied, and spread over a number of species. In particular his wonderful series of aberrations of *Argynnis euphrosyne* and *A. selene* have probably rarely if ever been surpassed. His specimens vary from completely black melanics through the colour range to cream and finally to white, including a great variety of confluent and barred forms, and finishing with a unique obsolete example of *selene*.

He had some remarkable *Maniola jurtina*, including several fine albinos, and his success with the blues, particularly *Lysandra coridon*, rivalled that with the small fritillaries. Outstanding among these were beautiful radiated, alba and striated forms, and a fine colour series.

Probably the most memorable experience in his many years of collecting occurred on 27th July 1944. He was examining *jurtina* on the North Downs and the day was very hot, with low heavy cloud. His attention was drawn to a number of *Lycuonopsis argiolus* on a small bush of dogwood. Approaching the boundary hedge consisting of a tall thicket of blackthorn, ash, dogwood and holly, he saw to his amazement, that for several hundred yards it swarmed with these butterflies at rest. Never having seen them in such profusion he proceeded to examine them wherever possible, with a view to making a good and variable series.

While looking at an apparently tattered specimen in the shade of the holly leaves he suddenly realised that the "tatters" were heavy radiations, and the butterfly when captured turned out to be a heavily marked female *ultra radiata*. Twenty minutes later he found a perfect halved gynandromorph, thus bringing off a right and left which it would be difficult to equal.

Immense enthusiasm, inexhaustible patience, and extremely hard work contributed to his success in the field, where it was always a delight to meet him. One of his most endearing qualities was his genuine and generous appreciation of another collector's modest captures. Many of us must have felt that perhaps, after all, some of our geese were really swans!

The downs and clearings in the south of England will not be the same without his friendly and cheerful presence.

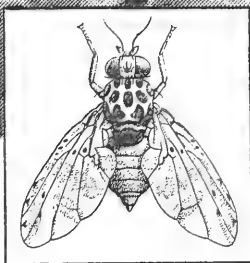
After a prolonged period of ill-health he had apparently recovered, and had recently moved from Hinchley Wood to Gomshall, where he was looking forward to his country surroundings, with easy access to so many of his favourite localities.

To the great sorrow of all his friends this was denied him. We extend our deepest sympathy to his wife and daughter in their irreparable loss, and to his brother Robert, who, in the world of butterflies, was his inseparable companion.

A. E. C.



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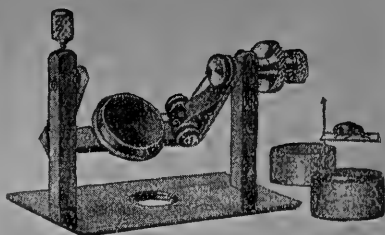
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THE ENTOMOLOGIST'S RECORD

AND JOURNAL OF VARIATION

Edited by S. N. A. JACOBS, F.R.E.S.

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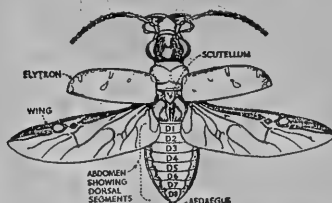


FIG. 2.—*Cicindela campestris* L., male. The Common Tiger Beetle.
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Notes on *Hyponomeuta irrorella* Hb.

By S. WAKELY

With the possible exception of *Hyponomeuta stannella* Thunb. *H. irrorella* Hb. is the rarest species in this genus. Excepting an unsatisfactory note that a moth "thought to be that species" was observed on Mickleham Down in 1948 (1), I can find no recent records of its occurrence, and whoever saw it on that occasion could have had no idea of the extreme rarity of this insect, or it would not have been mentioned in such a casual manner. My own view is that it was recorded as "*irrorella*", and that an editorial mistake was made in calling it *Hyponomeuta* instead of *Setina*, and the fact that the Dew Moth is not uncommon in some years at Mickleham supports this view.

On writing to the British Museum for the localities of the specimens in the national collection, Mr. J. D. Bradley wrote that the E. R. Bankes collection contains nine specimens of which six are labelled "e. coll. Burney '94 Wansworth?". All have a query after the place name, which undoubtedly should have been spelled Wandsworth. One specimen is labelled "P. Mason 1892", one "S. Stevens 1888" and one "e. coll. J. Weir '94". The last three have no localities. The Stevens-Stainton collection contains a longer series; two are labelled "July 2nd 1884, Kirby Stn." (these are obviously from W. Kirby, the Stn. being an abbreviation for Stainton), four "Shepard Britain '89", one "Crowley bequest 1901". Sixteen specimens, mostly from Lewisham, one from Sanderstead, and one from Charlton, were redetermined by Durrant as being the apple-feeding form of *H. padellus* L., thus considerably reducing the number of authentic *irrorella*. The Whittle collection contains seven specimens with no localities or dates, but a label states "ex coll. Sidney Webb". Mr. S. N. A. Jacobs tells me there are six specimens in the Fassnidge collection labelled "ex. S. Stevens collection"; Mr. L. T. Ford has two specimens from an old collection labelled "Mickleham 31.7.03" and there are three specimens with no data in the collection of the South London Entomological and Natural History Society. From the foregoing it will be gathered that this is a very rare species in Britain—that is as far as records go.

There is a note about the Wandsworth specimens in *The Entomologist's Weekly Intelligencer*, where it is stated by a Mr. W. Kirby that he was breeding this species again and would be happy to hear from anyone who wanted specimens (2). Mr. Kirby's address was at Wandsworth, and it seems likely that he supplied the specimens which gave that place as a locality, although the note itself does not say that he actually found the larvae at Wandsworth. Perhaps a reader could tell us whether this W. Kirby was the well-known author and worker at the British Museum.*

*William Forsell Kirby, the entomological writer and worker at the Brit. Mus. (Nat. Hist.), was b. 1844 and d. 1912. It would seem that he was too young in 1856 to have been breeding and offering lepidoptera for sale. The obituary of him (by Dr. W. Egmont Kirby) in this magazine (*Ent. Rec.*, 24: 314) indicates that he lived with his parents at Leicester until his father's death in 1854 "and in 1857 the family removed to Burgess Hill and afterwards to Brighton".—P.B.M.A.

Then there is a note by Thurnall written in 1923 (3) of the alleged breeding of a single specimen of this species from a larva found feeding on *Anthriscus sylvestris* in the Dartford district. Thurnall himself verified the specimen as *H. irrorella*, and stated that it had been taken by someone else in 1878. I do not think this record can be accepted as authentic considering the fact that specimens in the past had been misidentified. The interesting part is that Thurnall says that *irrorella* had vanished from its one British locality even before 1878, and that the species used to be taken at Wandsworth in the fifties and early sixties. Meyrick gives "Surrey, local, not found lately (4)".

On 12th July 1958, I attended a joint field meeting of the 'South London' and the Kent Field Club; the rendezvous was at a place in north-west Kent which I think it might be advisable not to mention in more detail. Just before lunch time, Mr. R. W. Uffen showed me an *Hyponomeuta* which he had just taken, and although I did not know much about *H. irrorella* myself, I felt sure it was that species, and Mr. L. T. Ford agreed that it was indeed the long lost *irrorella*.

After lunch we started grubbing about among the thick herbage growing at the base of bushes of *Euonymus europaeus* and several more specimens were taken. *H. cognatella* Hb. was also seen, and several batches of pupae of this common species were found. Later in the day Mr. L. T. Ford found two pupae of *irrorella*, from one of which a moth emerged a few days later: several empty pupa cases were also found. These occurred singly, the pupa in each case being plainly visible under a few loose strands of silk—very different from the dense white cocoon of *cognatella* which completely hides the pupa from sight, and the cocoons are also spun in batches of anything up to twenty or more in a mass.

The following week I visited the locality again with Mr. Ford. I had taken no *irrorella* myself on the first visit, but was lucky enough to take four on this occasion. We also found more empty pupa cases of *irrorella* in the vicinity of the spindle bushes. Most of these were on the leaves of honeysuckle, but we also found them on leaves of spindle, bramble, and hawthorn, usually, but not always, on the top side of the leaf.

My four moths were kept alive for a week in a large glass cylinder with a few sprigs of *Euonymus japonica*—no leaves of *E. europaeus* being available. At the end of a week I decided to kill and set the moths, after which I carefully examined the leaves to see whether there were any eggs, when I was pleased to find several batches of ova, varying from five to twenty eggs in each. The eggs were covered with a gummy substance and when examined under a good lens it was seen that this outer envelope was dotted with tiny purple specks. The eggs were laid either on the stem or at the base of the leaves close to the midrib.

By September I began to think that they must be infertile, as none had hatched. On examining one batch, however, I found that under the outer covering of the egg mass there were fully formed tiny yellowish larvae with black heads. They were examined under a lens and seen to be alive but very lethargic, and within a few weeks they had died and dried up.

It seemed fairly obvious that the larvae do not leave the egg-mass until the spring, passing the winter under the protection of the outer envelope, so the other batches were transferred to the garden, the leaves being bound to a growing plant of *E. japonica* by pieces of fine wire. Whether they will survive the winter and feed up in the spring remains to be seen, but if I am lucky, I shall have a further chapter to write on the early stages of this species.

H. irrorella is about the same size as *cognatella*, but the forewings are more grey in colour. The four longitudinal rows of black dots are very similar in number and position to those of *cognatella*, but the spots are very slightly larger. There is a perceptible dark grey suffusion at one-third, joining the dots in the third and fourth rows, in a similar position to the more conspicuous dark spot on *plumbella*, and a large dark grey suffusion between the second and third rows of dots starting before the middle and extending towards the termen but leaving a lighter grey area between it and the darker termen. When at rest the darker marks at one-third are more conspicuous, giving the effect of twin spots owing to their proximity when the wings are closed. This enables one to recognise the species at a glance in the field.

Mr. Uffen has found a Continental reference (5) which so accurately describes how we found the specimens that I will quote his translation:—

"*H. irrorella*. Scarce, singly between colonies of *cognatella* on *Euonymus* and *Prunus spinosa*. Pupa yellow with wing cases and hind end of the abdomen black. Without auxiliary cocoon, only lightly spun to the upperside of a leaf.

"*H. cognatella*. Pupa reddish yellow in thick white cocoons clumped together".

The reference to blackthorn as a food plant is interesting.

Can any reader give any more information about *H. irrorella*? Possibly there are other specimens about with locality labels attached. To me it seems that the majority, if not all of, the specimens in the old collections of well known entomologists originated from the same source, that is, from moths bred by Mr. W. Kirby of Wandsworth. Is there any proof that they were actually taken at Wandsworth, or did he know of a secret locality where they were to be found? The only exception is the two specimens from Mickleham in Mr. Ford's collection.

In conclusion I would like to express my thanks for help given in writing these notes, to Messrs. J. D. Bradley, L. T. Ford, and last but not least R. W. Uffen, who made the initial discovery, without which the presence of this rare moth in this locality would never have been suspected.

REFERENCES.

- (1) *Proc. S. Lond. ent. nat. Hist. Soc.*, 1948-49, p. 73.
- (2) W. Kirby: *Entomologist's Weekly Intelligencer*, 1856, p. 125.
- (3) A. Thurnall: *Entom.*, **56** (1923), p. 237.
- (4) E. Meyrick: *A Revised Handbook of British Lepidoptera* (1928), pp. 739-740.
- (5) K. Werner: *Die Larvalsystematik einiger Kleinschmetterlingsfamilien* (1958).

Inverness-shire in 1958

By Commander G. W. HARPER, R.N. (Retd.), F.R.E.S.

I have been sorely tempted to draw a veil of silence over the sad season of 1958, in my experience the most depressing for at least ten years. Second thoughts however prevailed; there is always something of interest even in the worst years, and comparison is impossible if nothing is said at all!

The Highland winter of 1957-8 was again a mild one as far as actual low temperatures went, but it was most depressingly prolonged practically to the end of May, by which time the birches were only in half leaf! Gallantly however the common Lepidoptera struggled out; *Phigalia pedaria* Fab. on 28th January, but the *Orthosias* and *Colostygia multistrigaria* Haw. did not appear until the last day of March!

The deeply pupating *Brachionycha nubeculosa* Esp. is less delayed by cold weather than most species, and it appeared together with *Brephos parthenias* L. on the 1st April. *Poecilopsis lapponaria* Bdv. did not begin emerging until 14th, though in Perthshire it was a little earlier. On this night, 14th April, occurred one of the highest m.v. trap catches of the year, 141 moths of 11 species, not to be equalled again until late July. On the 30th April my trap contained exactly 50 pairs of front wings and the largest, fattest long-eared bat of my acquaintance! This species of bat is not very common locally, but this is the second time it has invaded my trap while the common *Pipistrelle* never gets inside it. The sallows at last were well out by this date, but few moths patronized them.

May Day was, for once, a gloriously warm sunny day, so I made a brief expedition to Arisaig on the Western coast of Inverness-shire, to see how insects were faring there. As expected, some later species were out, including, *en route* by Loch Laggan, a freshly emerged *Apatele menyanthidis* View. drying its wings on a rock, whilst m.v. light in an oak glade overlooking the sea at Arisaig itself attracted a few *Chaonia ruficornis* Hufn., rather worn, fresh *Colocasia coryli* L., and *Lithina chlorosata* Scop., and quantities of *Ectropis bistortata* Göze. But even here the butterflies had only just begun to emerge, only one *Pieris napi* L. being seen.

Back in Badenoch, the slow progression continued. One of the few species to have a better year than recently was *Endromis versicolora* L., appearing first on the 2nd May, several females being found at rest between then and the 10th, about ten days later than normally. Swallows, sand martins and cuckoos were seen about the same date. The slow leafing of the birches was further retarded by some locally severe defoliation, particularly at Aviemore, to which Mr. P. Le Masurier drew my attention. The results of this were clearly seen in the Autumn when *Operophtera brumata* L., *O. fagata* Scharf., and *Erannis aurantiaria* Hb. were three more species to have a good year, being quite abundant. Several well-known Lepidopterists visited the Aviemore district in May; they found larvae fairly commonly, and especially *Aporophylla lutulenta* (f. *luneburgensis*) Schf., *Triphaena comes* Hb., and *Amathes agathina* Dup., but *Eurois occulta* L. and *Polia hepatica* Cl. (*tineta* Hb.) were scarce. Visits to the high tops

for the larvae of *Amathes alpicola* Zett. also produced very meagre results; clearly this lovely moth has not yet recovered its abundance of some fifteen years ago. *Anarta melanopa* Thun. was only beginning to appear in some numbers on the 28th May, a fortnight later than usual. On the 31st, Dr. Banner made an interesting rediscovery by taking a specimen of *Erynnis tages* L. near Aviemore. When I visited the spot a week later I found a colony in good heart, the first time I had seen the butterfly in Scotland. The first week of June in fact produced the first butterflies of the year in Badenoch, including *P. napi* and *Anthocaris cardamines* L. as well as *E. tages*; while *Cartocephalus palaemon* Pall. was emerging round the Great Glen.

The first migrant moth of the year, a *Plusia gamma* L. entered my m.v. trap on the 6th June, and this species bred successfully in the Highlands this year, being common in the late summer. Other migrants later were a few *Vanessa cardui* L. and two *Rhodometra sacraria* L. recorded by Mr. P. Le Masurier (*Ent. Rec.*, 70: 247). Later still in September a few *Vanessa atalanta* L. appeared for a very short stay on their way South. Several *Agrotis ipsilon* Hufn. turned up also at various dates in the late summer and autumn.

From the end of June to mid-July we spent a collecting holiday in North Wales, the southern part of Snowdonia. Here I had the delights of making the acquaintance of the local specialities, but that is another story. It must suffice here to observe that the weather continued to be unkind, very wet and stormy though not quite so cold. Insects seemed to be equally late here too; as an example *Tethea fluctuosa* Hb. was still producing fresh specimens on the 15th July!

Back in Badenoch on 18th July, the m.v. trap indicated that the early summer moths were still in good condition, but rather below average in numbers, due primarily to the unusual comparative scarcity of the commoners such as *Eumichtis adusta* Esp. and *Triphaena pronuba* L. On the other hand, *Amathes c-nigrum* L., usually uncommon here, was quite a nuisance! *Ammagrotis lucerneae* L. began flying in the afternoons over its almost inaccessible habitat of rocks and scree on 24th July. This is a fascinating species which rouses the hunting instinct in me more than most! This year I spent no less than seven afternoons perilously perched among the rocks, resulting in the capture of only two males, one of which escaped from my net! Very occasionally a female can be enticed to m.v. light, but I have so far failed completely to take the species at Wood-sage or other flowers, or sugar. Any suggestions please? It is a challenging creature.

Cloudy damp weather continued through most of August. *Triphaena sobrina* Bdv. was a little more common than usual, several visiting collectors obtaining some nice specimens. On my return from Unst on the 20th August (*Ent. Rec.*, 70: 286) the early autumnal species such as *Aporophylla lutulenta* Schf. and the *Hydraecias* were beginning to appear, the season still continuing to run about ten days later than usual.

September was mild and drier than most of the summer. A pleasant surprise was a good flight of *Oporinia filigrammaria* H.-S. The month ended with strong equinoctial gales and much rain.

October brought the season virtually to an end with the first cold spell and snow on the hills on the 15th. The large numbers of *E.*

aurantiaria, *O. brumata* and *O. fagata* in November and December closed yet another unsatisfactory entomological year of poor collecting weather; but it had its compensations!

Neadach, Newtonmore, Inverness-shire.

Lepidoptera and Other Insects in Dorset, June 1958

By B. R. BAKER

We normally work the Studland/Swanage area in September, but this year decided on an earlier visit and chose the third and fourth weeks of June.

As on previous occasions the m.v. equipment was stored on Studland Heath, and the familiar railway sleeper (used as a bedplate for the generator) and the weatherworn sections of oil drums (camouflage) were again pressed into service.

At the time, the weather experienced during the fortnight seemed little out of the ordinary, but compared with that of the following weeks we deemed ourselves very fortunate.

On Monday, 16th June, the day was spent at Lulworth Cove. There were very few butterflies on the wing although there was brilliant sunshine. An odd *Vanessa atalanta* L., and *V. cardui* L., were observed along the broken cliff-face whilst on the downland behind the Cove both sexes of *Iysandra bellargus* Rott. were to be found in very small numbers.

By comparison with Lepidoptera certain Trichoptera were abundant, particularly a Hydroptilid which was to be found running swiftly over the sunlit stone walls bordering the stream in the village street. The species was *Hydroptila macleachlani* Klap., females of which often exceed 4 mm. in length of anterior wing and are therefore large by comparison with other Hydroptilids. These little insects, although abundant, are not easy to box, for between their swift runs they can rest in the many crevices existing in these grey stone walls. *H. macleachlani* was also in abundance on a small stream at Swanage.

The generator was first tried out at Studland on 17th June when weather conditions were good, and between 10 p.m. and 2 a.m. 60 species of Lepidoptera were attracted to the lamp. A male *Apatele alni* L. appeared early in the night when the commonest moth on the sheets was *Arctia villica* L. From time to time females of *Macrothylacia rubi* L. huddled in amongst these early arrivals. *Diarsia festiva* Schiff. appeared in some numbers and all were worth examining, particularly so as several exhibited a marked banding of the forewings. Four species of hawk-moth appeared at intervals, *Deilephila porcellus* L. arriving soon after 10 p.m. followed later by *D. elpenor* L. and *Smerinthus ocellata* L. *Sphinx ligustri* L. appeared only after midnight. Other interesting species noted on this night were *Eustrotia uncula* Clerck and *Lobophora halterata* Hufn. *Leucania litoralis* Curt. was just appearing.

On 20th June a single *Heliothis peltigera* Schiff. was taken. On this occasion few species came to light, though *Plusia pulchra* Haw., which was absent on the far better night of the 17th, appeared as a singleton.

On 21st June I was joined by Mr. R. W. Parfitt. We had hoped to run two lamps but a last minute fault prevented this and we spent most of the time chatting, there being little of interest on the sheets. A solitary *Eurys chlorana* L. was beaten from sallow before starting the lamp, and the only other insect of note was a fine *Oleora repandata* L. form *conversaria* which came to Mr. Parfitt's paraffin lamp as we were packing away the gear.

The well-known Decoy Heath was visited on 23rd June, but it was obviously too early to see *Coscinia cribaria* L. We worked the rhododendron patches close to Decoy Pond to see if any bee hawks were present but only found numbers of the attractive Syrphid *Sericomyia silentis* Harris, which betrayed its presence on the blossoms by making a characteristic high-pitched note. Whilst we were sweeping for Trichoptera close to the water's edge, a pair of curlew became very disturbed and gave us a wonderful demonstration of diversionary tactics. The hubbly calls were themselves ample reward for visiting this area. The only discordant note of the whole afternoon was caused by the rather treacherous nature of the boggy ground bordering the pond which rather terrified my young son.

Fully grown larvae of *Leucania litoralis* Curt. were common at Studland on the marrams after dark, and a number of these were collected on the night of 24th June. These produced moths back in Reading from 1st-7th August. What a long emergence period *litoralis* has. It was on the wing by 17th June this year and my latest Dorset date for it is 7th September.

Whilst searching the marrams, numbers of Chrysopid lacewings were noted at rest. Killington in his *British Neuroptera* mentions one species, *Chrysopa abbreviata* Curtis, the records of which seem to indicate a definite association between this lacewing and the vegetation of coastal sandhills. Consequently a number of these Studland specimens were kept for later identification. However, they proved to be *C. carnea* Steph. and *C. ventralis* Curtis. Both of these are found commonly in deciduous and coniferous woodland, also in hedgerows, and one imagines that with fresh breezes numbers of them could well be blown from the scrubby patches at the back of Studland and on to the marrams.

We had hoped to attract *Agrotis ripae* Hüb. to the m.v. at Studland, but it was evidently not yet out. Larvae had been found the previous September under saltwort patches, hence I deemed it possible to find pupae by carefully sifting through the sand below the same patches. Most of one afternoon was spent on this quest but no *ripae* were found, only larvae, pupae and adults of the weevil *Otiorhynchus atroapterus* Deg. These were found down to a depth of 16½" which rather surprised me, for the sand at this depth was very compact around the saltwort roots.

The m.v. was run for the last time on the night of 27th June, but little arrived on the sheets until 50 yards more wire was paid out and the lamp moved into the shelter of some bushes away from the stiffish breeze on the dunes. Moths then arrived in some numbers especially *D. festiva* Schiff. Singletons included *Mimas tiliae* L., *D. porcellus* L., *Stauropus fagi* L. and *Schrankia costaestrigalis* Steph. Four *S. ligustri* L. brought the night's procedure to a close.

As far as Lepidoptera were concerned, these few records augured a poor season, which forecast was only too well borne out.

My thanks are due to Mr. D. E. Kimmins for checking the Neuroptera.

Microlepidoptera New to Scotland

By E. C. PELHAM-CLINTON

Included in this paper are records of fourteen species and one subspecies of Lepidoptera for which I can find no previous Scottish record. Accurate information on the distribution of the British species of Microlepidoptera is difficult to obtain, due not only to the lack of comprehensive lists from many areas but also to inadequate summarising of existing records. The distributions given by Meyrick (1928) are particularly deficient in the latter respect and are often inaccurate as far as Scotland is concerned. When preparing this list I first noted 42 species of Microlepidoptera which according to Meyrick did not occur in Scotland, but for which I had Scottish records; on further checking 29 of these proved to have been recorded for Scotland already, mostly a long time before 1928. Unfortunately Meyrick has been regarded as the final authority and his mistakes repeated by the authors of more recent reviews. It should be a warning to me that Heslop Harrison (1937), in an invaluable list of Lepidoptera from Raasay, recorded 11 species of Microlepidoptera (including Pyraloidea) as new to Scotland, every one of which had been recorded from Scotland before; and it is not unlikely that I shall be hoist with my own petard, for my index of Scottish records is as yet in an early stage.

Some of the records I have included are of captures by Dr. D. A. B. Macnicol, and I am very grateful for his permission to publish these; but my debt to him is far greater, for I have collected much in his company during the last eight years and have been shown many localities and species that I would otherwise have passed by. My thanks are due also to Mr. A. R. Waterston of the Royal Scottish Museum, Edinburgh, for making available to me the Museum card index of Scottish records of Lepidoptera, which covers much periodical literature that I have not indexed myself.

Vice-county numbers are given for all the following records in brackets after the name of the county. The nomenclature follows that of Kloet and Hincks (1945).

Chilo phragmitellus (Hübner). Occurs commonly in the extensive reed beds bordering the north side of the Tay estuary at Inchtute, Perthshire (88). It has not previously been recorded north of Northumberland.

Epagyge grotiana (Fabricius). Northumberland and Westmorland are the most northerly recorded limits for this species. While collecting with me in Glen Moriston, Inverness-shire (96) on 25th June 1955 Dr. Macnicol netted a fine large specimen of *E. grotiana*. Although this record is at present unique, this is not a locality to which such a species is likely to be transported by accident.

Lathronympha strigana (Fabricius) (= *L. hypericana* (Hübner)).

Another species recorded only as far north as Northumberland and Westmorland. I bred a few from larvae on *Hypericum* taken near Dunkeld, Perthshire (89), on 4th May 1953, and took another specimen in the same locality on 27th June 1955.

Batia lamdella (Donovan). While collecting with mercury-vapour light on the sandhills at Findhorn, Morayshire (95), on 5th August 1957 one of this species appeared at the light soon after dusk: I thereupon searched with a torch the numerous dead gorse and broom stems in the area, which had been burnt over about five years previously, finding three more on broom stems and one on gorse. I was up at dawn the next morning, hoping for the sunrise flight which often occurs in species of this family: a sea mist spoilt any chance there was of this, though one found stuck to the roof of my car probably flew at this time. A further specimen was found in the Robinson light trap. This is a remarkable extension to the recorded range for this species, which is quoted by Jacobs (1949) to reach only as far north as Norfolk.

Exaeretia allisella Stainton. A single specimen of this species appeared at a Tilley lamp on the machair at Kinlochbervie, Sutherland (108), on 2nd August 1953. I could find no *Artemisia* in the area and can offer no suggestion to account for this peculiar occurrence. There is a previous record from just south of the Border—Bolam (1931) took a specimen at Berwick in 1889.

Depressaria atomella scopariella Herrich-Schäffer. Although *D. scopariella* H.-S. has been treated as a synonym of *D. atomella* (Schiffermüller) by most British authors, it stands for a population which I believe to be at least subspecifically distinct from the typical form of that species. Lhomme (1948), treating *D. scopariella* as a species distinct from *D. atomella*, points out that it can be separated by the two dark bands on the third palpal segment, that of *D. atomella* being unmarked. By this criterion our Scottish population should be assigned to *D. scopariella*. This differs from *D. atomella* also in its dark coloration, without a trace of the pink of the English race—worn specimens could easily be passed over in the field as dark *subpropinqua* or even *applanata*. I have not had the opportunity of examining the genitalia of English material, but mounts made from Scottish specimens do not appear to differ from *D. atomella* as described by Pierce and Metcalfe (1935). It seems best at present to regard *scopariella* as a subspecies of *atomella*, even though both forms are quoted by Lhomme as having a wide distribution in France and may therefore have attained specific distinction in that country.

I have included records of this subspecies as new to Scotland, although the species was recorded from Forres, Morayshire, by Longstaff (1870) as *D. atomella*. This is one of the many Scottish records ignored by Meyrick (1928), who quoted a distribution reaching only as far north as Lancashire. My records are from Tayport, Fife (85), larvae on broom 28th June 1953 (moths emerged 1st-6th August 1953); Aviemore, Inverness-shire (96), 3rd May 1953, a few moths sitting on broom after dark; and Findhorn, Morayshire (95), 8th May 1954, very common on broom after dark, a few pairs seen *in copula*. English *atomella* are not recorded as hibernating in the adult state—a possible indication of specific distinction from *scopariella*—but Lhomme (1948),

curiously enough, gives the months xi-iii for *atomella* and vii, viii for *scopariella*.

Glyptopterix forsterella (Fabricius). Meyrick (1928) gives a distribution as far north as Worcester and Cambridge for this species, and there appears to be no record for the north of England or for Scotland. I have it now from two localities in the west of Scotland—Drimsallie, Loch Eil, Inverness-shire (97), 25th May 1957, one; and Port Appin, Argyllshire (98), 15th June 1958, several. *G. forsterella* is a difficult species to see on the wing and may often have been overlooked. In the Port Appin locality it appears to be distributed over a large area of bog, but is not common—I collected in the area for seven years before finding it. The commonest species of *Carex* which might serve as a foodplant in this locality is *C. nigra* (L.) Reichard.

Elachista exiguella Frey. In May 1952 Dr. P. J. Osborne of the Edinburgh and East of Scotland College of Agriculture presented me with two male *Elachista* caught on sticky traps at South Queensferry, West Lothian (84), on 21st and 24th April 1952. When mounted on slides they proved to belong to the *nigrella* group, but did not appear to be either *E. nigrella* or *E. stabilella*. Later the same year Bradley (1952) introduced *E. exiguella* to the British list on the evidence of a single Irish specimen: his description made it clear that the West Lothian specimens were also of this species. The Queensferry locality is now built over, and I have not been able to rediscover the species, but may have overlooked it among *E. nigrella*, which is very abundant locally in the Edinburgh area. A fourth British specimen, taken by me in Tresco, Scilly, in 1957 has been recorded by Richardson and Mere (1958).

Coleophora genistae Stainton. Dr. Macnicol first drew my attention to the presence of this species on *Genista anglica* L. at Aviemore, Inverness-shire (96). He once found it commonly, but heavily parasitised, but I have only found cases singly. My most recent record is of one case on 3rd May 1953, although I have searched for it on several occasions since. The most northerly records previously published were for Northumberland.

Lithocolletis cavella Zeller. In 1954 Dr. Macnicol bred a number of specimens of this species (the identification of which was confirmed by Mr. J. D. Bradley of the British Museum (Natural History)) from mines collected from small birches at Aviemore, Inverness-shire (96), on 30th September 1953. We have since obtained further mines in this locality, and I have a single specimen netted at Fort William, Inverness-shire (97) on 25th May 1957. These records constitute a great increase in the recorded range of the species in the British Isles—Meyrick (1928) gives only Kent, Essex and Hereford.

Lithocolletis geniculella Ragonot. I found mines of this species for the first time in Scotland at Whithorn, Wigtownshire (74), on 12th October 1958. In the two localities in which I have found the species in the south of England mines were on strong-growing young sycamore in hedges in very sheltered situations: the Wigtownshire mines were in a similar position, on sycamore suckers up to eight feet high at the edge of a wood. I have never been in this locality before and so have no evidence of the length of time the species has occurred in this area, but in view of its relatively recent discovery in the north of England

the inference that it is spreading northwards is strong: it would surely not have been overlooked in the north at a time when collectors of the micros were much more numerous than at present.

Ypsolophus nemorellus (Linnaeus). Yet another species recorded as far north as Northumberland but not further. Bolam (1931) states that it is widely distributed in Northumberland and has probably been overlooked across the Border. I have only two records for Scotland, however, and these both for the west—one at Kilmory, Ardnamurchan, Argyllshire (97), on 7th August 1956, and one at Scourie, Sutherland (108), on 30th July 1953.

Stigmella microtheriella (Stainton). It is very odd that there appears to be no record of this species for Scotland: in my experience it is one of the commonest species of the genus, occurring in most localities in the south of Scotland in which I have examined hazel in the autumn, and much more abundantly than the other hazel species, *S. floslactella*, for which Scottish records have been published. I have collected *S. microtheriella* from the following localities:—Penpont, Dumfriesshire (72); Roslin, Midlothian (83); Pitlochry, Perthshire (89); Clunes, Inverness-shire (97); Lochgoilhead and St. Catherine's, Argyllshire (98); and Achahoish, Knapdale, Argyllshire (101).

Stigmella glutinosae (Stainton). I have bred this species from mines on alder collected at Port Appin and at Lochhead, Loch Striven, Argyllshire (98), but can find no previous record for Scotland. Mines were quite common in the former locality in the autumn of 1955, but extremely localised in an extensive area of alder.

Eriocrania salopiella (Stainton). The species of *Eriocrania* are easily overlooked and have presumably been little collected in the Scottish highlands, where this species evidently has a wide distribution, but is uncommon, and, with *E. sparrmannella*, occurs later than the other species of the family. My records are from Camghouran, Rannoch, Perthshire (88), 25th May 1958, one; Aviemore, Inverness-shire (96), 18th-19th May 1958, two; Inverpolly, Ross (105), 19th May 1956, two; and Lairg, Sutherland (107), 14th May 1956, one. Heath (1958), the most recent reviewer of the Eriocraniidae in Britain, gives a range for *E. salopiella* extending as far north as Westmorland.

REFERENCES.

- Bolam, G. (1931). The Lepidoptera of Northumberland and the Eastern Borders [part]. *Hist. Berw. Nat. Club*, **27** (2): 221-265.
- Bradley, J. D. (1952). Microlepidoptera collected in the Burren, Co. Clare, Ireland, in 1951, including two species new to the British list. *Ent. Gaz.*, **9** (3): 115-147.
- Heath, J. (1958). The British Eriocraniidae and Micropterygidae. *Proc. Trans. S. Lond. ent. nat. Hist. Soc.*, 1957: 115-125.
- Heslop Harrison, J. W. (1937). The Lepidoptera of the Isle of Raasay and of the adjacent islands of Scalpay, South Rona, Fladday and Longay. *Proc. Univ. Durham phil. Soc.*, **9** (5): 305-328.
- Jacobs, S. N. A. (1949). The British Oecophoridae (Part I) and allied genera. *Proc. Trans. S. Lond. ent. nat. Hist. Soc.*, 1948-9: 123-141.
- Kloet, G. S. and Hincks, W. D. (1945). *A Check List of British Insects*. Stockport.
- Lhomme, L. (1948). *Catalogue des Lépidoptères de France et de Belgique*, **2** (5): 649-808. Le Carriol.
- Longstaff, G. B. (1870). Morayshire Lepidoptera. *Ent. mon. Mag.*, **6**: 214-216.
- Meyrick, E. (1928). *A Revised Handbook of British Lepidoptera*. London.
- Pierce, F. N. and Metcalfe, J. W. (1935). *The genitalia of the Tineid families of the Lepidoptera of the British Islands*. Oundle.

Richardson, A. and Mere, R. M. (1958). Some preliminary observations on the Lepidoptera of the Isles of Scilly with particular reference to Tresco. *Ent. Gaz.*, 9 (3) : 115-147.

34 Craigmillar Park, Edinburgh 9, 7.i.1959.

Moths and Light

By L. G. STIMSON, F.R.E.S., A.I.M.L.T.

Now that the use of various types of mercury vapour lamps has become general and widespread among lepidopterists I would like to pass on a few facts and notes on experiments which may be of interest to fellow entomologists.

Regarding the type of lamp, I have taken some trouble to ascertain the best source for producing the most suitable light effect for "attracting" moths.

It is, of course, well known that insects are sensitive to quite a different range of spectrum wave-lengths from that to which humans are sensitive. The insect range begins at about 5,500 Å to about 2,300 Å (well into the ultra violet region). In theory it would therefore seem that the type of light we require would have to be rich in ultra violet, to which moths and other insects are particularly sensitive, and yet with enough visible light to enable us to see what we are doing if working a lamp in the field without a trap—a thing I never use.

The common tungsten filament lamp has been in use for some years now, and I understand that Mr. S. G. Smith of Chester was the first collector to take a generator out into the field so that a really intense light could be used (1,000 W.). Now only 8% of the light emitted by an incandescent tungsten filament is visible to the human eye and this is mostly in the yellow-red region; no true u.v. is produced. It can be seen, then, that to produce a light of this kind which is of sufficient brilliance to attract insects, one must run a lamp of very high wattage and even then there would be no u.v. If this said lamp is to be operated on all good nights, as is the custom of many of us, the economic factor becomes quite a consideration. The only thing to be said in favour of this type of lamp for our purpose is that the initial outlay is comparatively small.

Discharge lamps first came into prominence a few years before the war and since the war they have been developed considerably. If an electric discharge takes place in a gas or vapour, light is emitted, and the spectral content of the rays can be varied by the elements used and the pressure, which in hot lamps builds up. Discharges in certain gases, *e.g.* hydrogen and mercury vapour, give off a considerable amount of u.v., and this is the effect which has been used by entomologists with such prolific results over the past few years.

There are various firms which make mercury-discharge lamps and the standard types available can be divided roughly into five classes:

(i). Medium pressure tubular lamps in clear glass.

(ii). High pressure bulb-shaped lamps in Wood's glass envelopes. I have not been able to find out the constituents of this glass, but it transmits infra red and u.v. rays having a wave-length of between 3,000 and 4,000 Å. Nearly all the visible light (in this case mostly in the blue-green region of the spectrum) is absorbed and therefore wasted.

(iii). Lamps having an envelope of special transmission glass, which is made from aluminium silicate, having the trade name "Suprema". This has properties similar to Wood's glass as regards its transmissibility, but allows visible light through also. They are flask-shaped with the bulb partly silvered, and have a tungsten filament in series with the discharge, which obviates the need to use a choke and acts as an additional light source.

(iv). Lamps having a high pressure discharge in silica and enveloped in glass (a hard glass is employed for higher wattage lamps to avoid cracking), and coated on the inside with a fluorescent powder to increase visible light per watt.

(v). There are also other more specialized lamps with silica envelopes at prohibitive prices and, as far as I can see, of no use to an entomologist. Hydrogen arc lamps in silica have the same drawbacks.

Glass (soda or hard types) absorbs nearly all u.v. unless the thickness is in the region of $10\ \mu$, so lamps made from this material are not so efficient, entomologically speaking, as those made from Wood's or "Suprema" glass, but even so are worked effectively by many entomologists, as the light produced is rich in rays situated in the blue end of the spectrum. A lamp encased in "Suprema" glass is more desirable, but as far as I have been able to find out these are made only in the form of a blended lamp, *i.e.* in series with a tungsten filament and having an efficiency of about 30 lumens per watt.

The Wood's glass envelope type is also useful, particularly when there is any likelihood of disturbing neighbours. From my experience and that of others, it is a more effective means of attraction, watt for watt, than a glass envelope high pressure lamp; the rays are not particularly dangerous to humans if reasonable care be taken, and the cost is about £6 10s. 0d.

In the case of fluorescent lamps, the internal coating (usually a phosphorus compound) absorbs most of the u.v. which excites it to emit visible light, thus having the effect of changing the wave-length. This is a very desirable thing to do as far as ordinary use is concerned and an efficiency of up to 45 lumens per watt is obtained. However, for our purpose a quite undesirable result has been produced and I would not advise anyone to buy this type of lamp for entomological purposes.

Silica is of course the ideal medium and rays of all wave-lengths produced by a mercury discharge will be transmitted. After trying most other types of lamps, including carbon arc, I decided that this would be the ideal and ordered a 250 watt fluorescent high pressure Phillips lamp (made in Holland) with operating equipment (cost £15 0s. 0d.) and had the boro-silicate bulb replaced with clear silica. I have been working this lamp during part of the 1958 season with spectacular results, and I hope to present some of these in the "*Record*" when complete. In my opinion, this lamp may represent the optimum source of "attraction" to insects and very possibly it surpasses this point as dazed moths are often found which have not quite come up to the lamp.

I have gone into the possibility of converting the yellow-red rays to blue as this would make a very useful adaptation of the tungsten filament lamp although not much use with m.v. Although this is possible

with an image converter it is not practical and, as far as I know, there is no substance which could replace the previously mentioned phosphorus compound to convert red to blue rays. A further disadvantage is that red rays lack the energy possessed by u.v. and so even when their wave-length has been changed, there is a big apparent loss of output. However, perhaps some other experimenter could take this up and prove that I stopped too soon!

The short wave-length u.v. is, as is well known, very inimical to living tissue and care must be taken in its use. Also, ozone is created in its presence, which would not do one any good in a closed room. I use goggles which absorb u.v. when working near my modified lamp and spectacle lenses prevent u.v. entering the eye though the surrounding tissue may be effected, causing pain. I have been particularly careful since an unpleasant incident—not without its funny side—taught me a lesson which I should not have needed. I had borrowed a portable generator which Mr. A. C. R. Redgrave had kindly lent me, and was working it with my lamp at Delamere Forest with a friend. I had my goggles and he his spectacles. This was the first time I had worked it in the open, as previously I had been using it only at home from my bug-room window. We were sitting most of the time on the sheet, at either side of the lamp, he on the right and I on the left. We frequently bobbed up for a special arrival or just a general look over the mass of livestock on the sheet. We both took several species new to our respective collections, but as far as I can remember *D. nerii* did not turn up on that particular hunt. When we eventually—regretfully—packed up, we were both experiencing a slight soreness and my friend a tingling about his eyes. Three days later we were both deeply tanned on one side of our faces, he on the left and I on the right. Our social appearances were severely curtailed for a week or two, as can be imagined! My friend suffered more than indignity as he had severe irritation round his eyes where the u.v. had gone behind his spectacles. My right eye was ringed with normal-coloured skin with a sharp line of demarcation showing how effectively the goggles had protected me. During more recent field work I have worked in the vicinity of the lamp (i.e. about 6 feet) with goggles and have experienced no after-effects at all.

If anyone is interested in converting his own lamp as I have or in having it encased in "Suprema" glass I will gladly supply details if he will write to me.

I sometimes wonder, when looking over the moths which have just come into my lighted bug-room, whether moths are really "attracted" as was once the general belief. They seem to enjoy sitting on an illuminated ceiling or wall just as we like to laze in the sun.

SUMMARY:—Various types of lamps have been examined as possible means of "attracting" insects.

CONCLUSION:—The 250 w. Phillips high pressure mercury vapour lamp modified by replacing the glass envelope with silica is probably the best insect-attracting source now available, and no brighter lamp need be contemplated for this purpose.

ACKNOWLEDGMENTS:—I should like to thank Mr. D. Pilbrow, sales manager of the Phillips lighting department, for the help and advice

he has given me. I should also like to thank Mr. J. Jenkins, M.A., of Mullard Radio-Valve Co. for reading this paper for me.

26 Pemberton Road, Lyndhurst, Hants, 8.i.1959.

Notes on the Microlepidoptera

By H. C. HUGGINS, F.R.E.S.

Eurhodope cirrigerella Zinck. I have had only one reply to my request for information on recent captures of this moth; this is from Mr. D. W. H. ffennell of Martyr Worthy Place, near Winchester. Mr. ffennell has kindly informed me that he took a perfect male in a light trap (not m.v.) in his garden on 28th June 1957. The trap was placed on the edge of a paddock where *Scabiosa arvensis* grows freely, but although Mr. ffennell searched the paddock several times afterwards in both 1957 and 1958 he saw no others. It is quite possible that the moth was a wanderer from some little distance, as a number of the Crambids and Phycitids make unusually long flights at times, as we are learning from m.v. captures.

I told Mr. ffennell of the exact localities where Mr. Fassnidge, Mr. Gilles and myself took a fair number before the war, but, as I feared, he tells me that all these have now been destroyed by agricultural changes.

The moth must, however, still exist somewhere as this capture shows, and as Meyrick took it in Wiltshire, and the late Professor E. G. R. Waters in Berkshire, beside the Hampshire localities already mentioned. A good search in scabious-growing pockets on the chalk downs of these counties should lead to its re-discovery.

Crambus craterellus Scop. Mr. P. E. W. Whalley of the B.M. is at present at work on the group of insects mixed under this name in our cabinets, and I am looking forward to his results with some eagerness. I hope that anyone who possesses British, or, more probably, reputed British specimens will submit them to Mr. Whalley to aid in his researches. I only possess two, and they are the only two Crambids in my collection concerning whose bona fides I am very doubtful.

Mr. Whalley has examined both; one turns out to be true *craterellus*. It came from E. B. Nevinson's collection, and Nevinson only collected British insects, but he was sometimes the victim of fraud, as in the case of the *C. verellus* Zinck. in his series which were labelled "Griffiths, Cambridge" and were certainly not from that source, as the whereabouts of all four of Griffith's insects is known, and my *craterellus* was unlabelled.

My other insect, which is from Dr. Horley's collection, labelled "Howard Vaughan's collection", turns out to be *cassentiniellus* Zell.

These are very beautiful insects which were, unfortunately, the subject of a good deal of diddling in the second half of the nineteenth century, Meek and Button both being singularly successful in obtaining them. I frequently wonder whether they were ever genuinely captured in this country; the records in Barrett are decidedly vague excepting two, one by Hemmings near Brighton in 1855 and the other by Sidebotham at Folkestone in 1860, and I believe none has been recorded in this century.

Craterellus does not seem, *prima facie*, to be a migratory type, and until a few turn up at m.v. traps I shall still feel doubtful. On the other hand recent extraordinary captures at m.v. of insects considered non-migratory make me less inclined to dogmatize on the subject than I should have been ten years ago.

In 1957 I took *Platytes alpinellus* Hüb., previously unknown in Essex, in my garden here at Westcliff; this is usually considered a completely non-migratory insect, and on 10th August 1958 I took a male of the chalk-hill *Phycita semirubella* Scop. in the same trap and on the same night Mr. A. J. Dewick took another at Bradwell-on-Sea. This moth emerges in late July and August as a rule, but on 1st June 1933 I took a rather large and not quite fresh male on the cliffs at Beer, South Devon. This capture has, until last summer, puzzled me completely, but I am now inclined to think it was an immigrant from some southern country where the moth emerges earlier than here.

Notes on Orthoptera for 1958 from Breconshire, Kent and Oxfordshire

By J. F. BURTON

BRECONSHIRE AND HEREFORDSHIRE

From 27th to 29th August I stayed at Capel-y-ffin in the Black Mountains, close to the boundary between the two counties. The weather was not suitable for finding grasshoppers, since spells of sunshine were infrequent and it was not, therefore, often possible to hear the males stridulating.

On 27th August I crossed the Black Mountain from Longtown to Capel-y-ffin. Grasshoppers were not at all common, but weather conditions were unsuitable for them and I succeeded in finding only one *Chorthippus parallelus* (Zetterstedt) and two *Omocestus viridulus* (Linn.). The former was discovered in a rough, grassy slope on the Herefordshire side of the mountain at about 600 feet, one of the *viridulus* at 1,000 feet on the same side and the other at 1,200 feet on the Breconshire side.

Next day, I walked up the valley of the Afon Honddu between Darren Lwyd and the Black Mountain. Fortunately, there were frequent spells of sunshine that morning and I was soon attracted to a large colony of *O. viridulus* in the rough grass near the road by the stridulating of the males. They were also numerous in the lush grass and bracken growing on the banks of a brook which flowed swiftly down the steep slope of Darren Lwyd. The whole colony was situated at an altitude of between 1,800 and 1,900 feet and all the individuals I examined were of the beautiful, intensely green mountain form which Dr. M. Burr mentioned in *British Grasshoppers and their Allies* (London, 1936).

KENT

The morning of 24th August was very sunny and, with K. H. Hyatt, I searched for grasshoppers on the North Downs around Eynsford and Shoreham. We examined several grassy fields, but only managed to find a few scattered colonies of *C. parallelus*. Heavy rain set in by the early afternoon and, after celebrating the Darwin Centenary by visiting his

old home at Downe, we called in at Sundridge Park, near Bromley, on the way home. In the pouring rain I collected two female *O. viridulus* in long grass at the edge of a swamp. This species appears to be unaccountably local in North-west Kent. Both specimens I obtained were noticeably larger than the females I collected in the Black Mountains. On the higher ground, *C. parallelus* was common.

On 11th October I visited Abbey Wood Marshes, near Woolwich, and after a hard search found a male and female *Chorthippus albomarginatus* (De Geer) in overgrown pastureland. This appears to be a late date for this species. I also caught two (♂ + ♀) *Roeseliana roeselii* (Hagenbach) in long grass and heard another stridulating. Although listened for, *Tettigonia viridissima* Linn., which is common in these marshes, was not heard stridulating. *Chorthippus brunneus* Thunberg was common on a grassy bank. The grass here is very sooty, owing to the close proximity of heavy industry, and many of the grasshoppers were dark grey or blackish in colour. Is industrial melanism spreading to grasshoppers? This species spends much of its time at the foot of the grass stems where most of the soot collects. Hence, the dark individuals would appear to be at an advantage compared with the lighter ones.

I have noticed the same thing among *C. brunneus* on Blackheath in S.E. London, which is also close to heavy industry. In this locality, in 1958, I found a high proportion of dark specimens, including some which were completely black, except for a greenish ventral surface. Living *brunneus* were still common in sheltered spots on Blackheath at least as late as 9th November. I kept two black individuals alive at home until 18th November by keeping them in a room temperature of 50°-60° F.

OXFORDSHIRE

On 10th September at Cowley, near Oxford, I found *Pholidoptera griseoaptera* (De Geer) very common in rough grass and thick vegetation around an old army camp. They were to be heard stridulating from 4 p.m. onwards. *C. parallelus* was also very common and on the 11th I found about 30, mostly females, sitting crammed close together on a large dock leaf, sunning themselves—an amazing sight.

43 Eversley Road, London, S.E.7. 28.i.1959.

Scandinavian Ants

By C. A. COLLINGWOOD

Forsslund (1957) brought the distribution and nomenclature of Swedish ants up to date. This valuable paper not only lists those species that have been verified for Sweden but also indicates their occurrence in adjacent countries including Norway and Denmark. The Swedish fauna is especially interesting in that all the species known to occur in North Europe are to be found there in some abundance while at the same time there are a number of species such as *Camponotus fallax* Nyl., *Formica cinerea* Mayr and *Leptothorax corticalis* Sch. which are usually regarded as members of a more southern fauna. Although most of Scandinavia lies to the north of Britain, the summer climate of many areas of the south-east is considerably warmer than that of south Britain and the July temperature means of Stockholm and Oslo (Lat. 59°) for example, are comparable with that of Bournemouth (Lat. 50° 43').

The writer visited Scandinavia on a short holiday in June 1958 and had the pleasure of seeing some of the more interesting species in their natural environment and also of adding a few new provincial records for some of the commoner species. Dr. K. H. Forsslund very kindly showed me two bog inhabiting Formica species in the neighbourhood of Stockholm, *F. forsslundi* Lohm. and *F. uralensis* Ruzs. *F. forsslundi* is an *exsecta*-like species constructing a small mound nest of pieces of grass and heather in boggy ground. The workers are smaller on the average than those of *exsecta* and considerably more shining. According to Dr. Forsslund, new colonies may be started with the assistance of *F. transcaucasica* Nas. which was common in the neighbourhood. *F. forsslundi* has not so far been found outside Sweden in Scandinavia.

F. uralensis is another interesting species resembling other wood ants in behaviour and size. It is distinguished from these by the colour of the head which is entirely black, the thorax which has the back of the pronotum and part of the mesonotum with a dark patch as in *nigricans* and the frontal area which is matt. This species appears to be restricted to open boggy areas in the forests of North and Central Europe, a habitat which is completely contrasted to The Steppes of Eastern Europe where the species was originally discovered. Bisgaard (1944) has suggested that the ant originally inhabited similar steppe like areas in North Europe but through competition with members of the *F. rufa* group of species, has only been able to survive in bogland. Its association with this habitat is however so general throughout Europe from Lapland to Switzerland that it appears to me much more probable that the present species is not the same as Ruzsky's *uralensis* from the Steppes.

Dr. Forsslund also showed me a nest of *F. cordieri* Bond. This species closely resembles *nigricans* except in the queen caste where there are considerable pilosity differences including the presence of long hairs on the scale and the back of the thorax which are absent in *nigricans*. *F. cordieri* according to Forsslund is the commoner of the two species in South Sweden. I also saw it in other localities including Grebbestad and Falkenberg in South-west Sweden. In Norway however I only saw *nigricans* at Hauerseeter, Halden and Svinsund in the south. Both species are found in isolated nests on dry banks and warm open sites at the borders of woodland.

The great abundance of wood ants throughout Scandinavia especially in the great forests of Norway and Sweden provides the greatest contrast with Britain where these ants are absent from large areas of countryside and often very localised where they do occur. Such species as *F. aquilonia* Yarrow, *F. lugubris* Zett., *F. truncorum* Fab. as well as *F. sanguinea* Latr. and *F. exsecta* Nyl. are common within the arctic circle. I found *aquilonia* alone in the neighbourhood of Narvik (Lat. 68° 27') and on the Lofoten islands but the other species were general in the scrubby arctic woodlands around Gällivare and Kiruna in North Sweden as well as further south.

In South Norway it was possible to find all these species as well as *F. rufa* L., *F. polyctena* Först and *nigricans* together within the same area of woodland. At Hauerseeter about 20 miles to the north west of Oslo, for example, I found a nest of *lugubris* only 20 paces away from *nigricans*, whereas in Europe generally the two species are usually

widely separated. In Britain, *rufa* and *lugubris* have never been found occupying the same locality, as Yarrow (1955) pointed out, yet in Norway these species were found side by side both at Hauer seter and in the extreme southern tip of Norway near Svinsund. Moreover sexuals of the two species were present at the same time together. At Greb bestad in South-east Sweden, alatae of both *cordieri* and *rufa* were flying on the same day, 26th June. It is evident that every opportunity exists for cross mating of most of these species in parts of Scandinavia but it is equally evident that this does not in fact occur as all the species in this group remain distinct and easily distinguishable over their whole geographic range.

F. polyetena Först was considered to be a good species by van Boven (1947) and this is likely to be confirmed by the researches of Mr. E. T. G. Elton and Dr. J. G. Betrem in the Netherlands. *F. polyetena* is a polydomous species and I am grateful to Mr. Elton for having shown me sites near Arnhem in the Netherlands where its behaviour pattern was characteristically developed. Its habits appear to be similar to those described by Gösswald (1942) for '*rufa rufo-pratensis* var. *minor*' with which it is probably morphologically identical. It is the most hairless of the *rufa* species and is probably the same as the form described as 'var. *nuda*' by Holgersen (1944) from the island of Hvaler in Østfold, Norway. I found this ant at Hauer seter, Akershus, where there was a group of nests on a bank. I also took specimens believed to be this species from a single nest near Lake Frescati, Stockholm. In general, however, *rufa* in the form that occurs in Britain was much the most abundant in the few areas visited in South Norway and South Sweden. Mgr. Chas. Bisgaard informed me that he had not seen live *polyetena* in Denmark although there were four workers so labelled in the Copenhagen Museum.

I was fortunate in finding incipient mixed colonies of members of the *rufa* group with those of the *fusca* group on three occasions. The first was at Lulea in North-east Sweden where there was a nest in the stony border of a track consisting of about a dozen very small discoloured *lugubris* workers with one *lugubris* queen and a number of workers of *F. lemani* Bond. A similar nest was found under a stone by the side of the road halfway between Bodo and Fauske in North-west Norway. Here the *lugubris* workers were larger and brighter coloured and the *lemanii* workers apparently more numerous. A *rufa* queen was found in the centre of a small nest of *F. fusca* L. under a stone at Hauer seter. The queen was alive and apparently being tended by the workers but the leg joints had been so injured that unaided locomotion was impossible.

Holgersen (1943) was the first to recognise that *F. fusca* var. *gagatoides* Ruzs. was a distinct species and he redescribed it from Norway, where it is widely distributed. Forsslund (1957) also lists it from the provinces of North Sweden. This interesting species occurs in North Russia where it was originally described and in Finland but is not known from anywhere south of Scandinavia.* It closely resembles *fusca*

*Since the above paper was written, Dr. H. Kutter has informed me that he has recently discovered both *Formica forsslundi* Lohm. and *F. gagatoides* Ruzs. in the Swiss Alps.

in habits but does not apparently occur within the range of that species. I found it abundantly in Arctic Sweden and on the Dovre plateau and the Jotunhiemen in Norway. *F. lemani* was also present at all these places, occupying similar nest situations. The latter ranges much further south than *gagatoides* in Scandinavia and I found it together with *fusca* at both Hauer seter and Svinsund. It was noteworthy that only *lemanii* of this species group was seen in the Narvik area which part of Norway seemed to correspond most with the North-west Scottish Highlands. *F. gagatoides* was found to range to higher altitudes than any of the other *Formica* species and was found for example up to 1,000 m. in the Jotunheim mountains. This was above the limit for scrub tree vegetation in that area. *F. lugubris* and *exsecta* however were found nearly as high up the mountains at 850 m. at the approximate tree limit.

Examples of *F. exsecta* taken at this altitude and also at Kiruna in North Sweden were much hairier than those seen from other parts of Scandinavia or from Scotland and these may perhaps belong to a distinct species provisionally described by Betrem (1954) from Finland as *kontuniemii*. Much further collecting of this group including sexuals is required however before it is possible to assess these differences correctly. *F. suecica* Adlerz is another species similar to *exsecta* that is widely distributed in Norway, Sweden and Finland but not apparently elsewhere. Unfortunately I was unable to find this ant for myself. Mgr. Bisgaard kindly took me to see some nests of *F. pressilabris* Nyl., another member of this species group, at Tisvildeleje in Zealand, Denmark. One nest was in open sandy ground with very little leaf litter; the other was in a bank nearby.

I was also shown some *Myrmica schencki* Em. nests at the same locality. The openings to the nests had the tubular prolongations of closely-woven plant fibres that Bisgaard (1944) described. Both Holgersen (1944) and Forsslund (1947) were doubtful with regard to previous records of *M. rubra* L. (*laevinodis* auctt.) in North Scandinavia. However, O'Rourke (1949) recorded this species from Narvik and I found colonies by the seashore at Kabelvag near Svolvær in the Lofoten islands well within the Arctic Circle. I also found this ant in two places between Luleå and Gammelstad in North Sweden. The commonest *Myrmica* species in the north, however, were *M. ruginodis* Nyl., *sulcinodis* Nyl. and *lobicornis* Nyl. The latter in particular appeared to be more abundant generally than it is in Britain. One nest in a pine stump at Gällivare contained four winged queens which must have overwintered in the nest as at that date, 14th June, spring had only just begun in the Arctic. I was fortunate in discovering a large nest of the uncommon *M. rugulosa* Nyl. in sandy pasture at Halmstad in South Sweden.

Harpagoxenus sublaevis Nyl., an interesting semi-parasite, was found together with its host *Leptothorax muscorum* Nyl. at Stockholm and also with *L. acervorum* Fab. at Abisko and at Hauer seter. *H. sublaevis* is unlike many other similar parasitic or dependant species in that its presence in a colony does not appear to affect the development of the host species including the appearance of sexuals, in any way. *L. muscorum* was very abundant in oak trees in the Stockholm

parks, often occurring in the same trees occupied by *Lasius brunneus* Latr. as *L. nylanderi* Först does in England and France.

A locality list of all the species seen in Norway and Sweden is given below. In all cases the nearest town is given as locality and an asterisk indicates those records believed to be new for the province in which the town occurs.

Formica polyctena Schenck. Sweden—Stockholm*.

Norway—Hauerseter*.

„ *rufa* L. Sweden—Stockholm, Grebbestad, Halmstad, Falkenberg.

Norway—Hauerseter, Halden, Svinsund.

„ *aquilonia* Yarrow: Sweden—Lulea, Gammelstad.

Norway—Hauerseter*, Svinsund*, Narvik, Svolvaer, Fauske, Saltdal, Hjerkin*, Elveseter, Lom.

„ *lugubris* Zett Sweden—Lulea, Gammelstad, Gällivare.

Norway—Fauske, Hjerkin*, Elveseter, Lom, Hauerseter*, Svinsund*.

„ *cordieri* Bond. Sweden—Stockholm, Grebbestad, Falkenberg.

„ *nigricans* Em. (Sweden—Halmstad*, workers only).

Norway—Hauerseter*, Halden*, Svinsund.

„ *truncorum* Fab. Sweden—Stockholm, Kiruna, Grebbestad*.

Norway—Hauerseter*, Halden*.

„ *uralensis* Ruzs. Sweden—Stockholm.

„ *sanguinea* Latr. Sweden—Stockholm, Lulea, Gällivare, Grebbestad*, Halmstad.

Norway—Lom*, Hauerseter, Halden, Svinsund.

„ *excsecta* Nyl. Sweden—Stockholm, Kiruna, Grebbestad*.

Norway—Fauske, Elveseter, Hjerkin*, Hauerseter.

„ *forsslundi* Lohm. Sweden—Stockholm.

„ *rufibarbis* Fab. Sweden—Stockholm, Grebbestad.

Norway—Svinsund*.

„ *lemanii* Bond. Sweden—Lulea, Gammelstad, Gällivare, Kiruna, Abisko.

Norway—Narvik, Svolvaer, Fauske, Hjerkin*, Elveseter*, Lam, Saltdal, Hauerseter*, Svinsund*.

„ *fusca* L. Sweden—Stockholm, Grebbestad, Falkenberg, Halmstad, Hälsingborg, Göteborg.

Norway—Lom, Hauerseter, Halden, Svinsund.

„ *gagatoides* Ruzs. Sweden—Gällivare, Kiruna, Abisko.

Norway—Fauske, Hjerkin*, Elveseter*.

„ *transcaucasica* Nas. Sweden—Stockholm.

Camponotus herculeanus L. Sweden—Stockholm.

Norway—Hauerseter, Svinsund.

„ *ligniperdus* Latr. Sweden—Stockholm.

Norway—Hauerseter, Halden, Svinsund.

Lasius niger L. Sweden—Stockholm, Göteborg, Hälsingborg, Grebbestad, Falkenberg, Halmstad.

Norway—Hauerseter.

- Lasius alienus* Först. Sweden—Falkenberg*, Halmstad.
 „ *brunneus* Latr. Sweden—Stockholm.
 „ *flavus* Fab. Sweden—Stockholm, Grebbestad, Falkenberg, Halmstad, Hälsingborg.
 Norway—Hauerseter, Halden, Svinsund.
Myrmica rubra L. Sweden—Stockholm, Gammelstad*, Grebbestad, Falkenberg, Halmstad, Hälsingborg.
 Norway—Svolvaer, Hauerseter, Halden.
 „ *ruginodis* Nyl. Sweden—Stockholm, Lulea, Gällivare, Kiruna, Halmstad, Falkenberg, Grebbestad, Hälsingborg.
 Norway—Svolvaer, Elveseter, Hauerseter, Halden, Narvik.
 „ *sulcinodis* Nyl. Sweden—Lulea, Gammelstad*, Gällivare, Abisko.
 Norway—Fauske, Hjerkin, Elveseter*, Hauerseter*, Halden*.
 „ *lobicornis* Nyl. Sweden—Stockholm, Lulea, Gammelstad, Gällivare, Kiruna*, Grebbestad.
 Norway—Fauske, Hjerkin, Elveseter*, Hauerseter, Svinsund.
 „ *schencki* Em. Sweden—Stockholm, Grebbestad.
 „ *sabuleti* Mein. Sweden—Stockholm, Grebbestad, Falkenberg.
 Norway—Svinsund.
 „ *scabrinodis* Nyl. Sweden—Stockholm, Grebbestad, Falkenberg, Hälsingborg.
 Norway—Svolvaer*, Halden.
 rugulosa Nyl. Sweden—Halmstad.
Leptothorax acervorum Fab. Sweden and Norway—All localities.
 „ *muscorum* Nyl. Sweden—Stockholm, Grebbestad.
 „ *tuberum* Fab. Sweden—Stockholm, Grebbestad.
 Norway—Svinsund.
Harpagoxenus sublaevis Nyl. Sweden—Stockholm, Abisko.
 Norway—Hauerseter.
Tetramorium caespitum L. Sweden—Stockholm, Grebbestad, Falkenberg.
 Norway—Svinsund.
Formicoxenus nitidulus Nyl. Sweden—Stockholm.
 Norway—Hauerseter.

REFERENCES.

- Betrem, J. G. 1954. 'De satermier (*Formica exsecta* Nyl., 1846) en enkele van haar problemen (Hym. Form.)'. *Ent. Ber.*, **15**: 224-230.
 Bisgaard, C. 1944. 'Meddelelse om nogle nye Myrer for Danmarks Fauna'. *Saettryk af Entomol. Meddel.*, **24**: 115-26.
 Boven, J. van. 1947. 'Liste de determination des principales especes de Fourmis belges (Hymenoptera Formicidae)'. *Bull. et Ann. Soc. Ent. de Belg.*, **83**: 16-90.
 Forsslund, K. H. 1947. 'Svenska myror'. *Entomologisk Tidskrift*, **68**: 67-80.
 ——— 1957. 'Catalogus Insectorum Sueciae XV Hymenoptera: Fam. Formicidae'. *Opusc. Entom.*, **22**: 70-78.
 Gösswald, K. 1942. 'Rassenstudien an der Roten Waldameise, *Formica rufa* L.'. *Z. angew. Ent.*, **28**: 62-124.
 Holgersen, H. 1943. 'Formica gagatoides Ruzsky in Norway'. *Tromsø Mus Arshefter*, **64**: 1-15.

- Holgersen, H. 1944. 'The Ants of Norway (Hymenoptera, Formicidae). *Mag. f. Naturvidenskapene*, **84** : 165-202.
- O'Rourke, F. J. 1949. 'Myrmecological Notes from Narvik, Northern Norway'. *Norsk Entomologisk Tidsskr.*, **8** : 47-50.
- Yarrow, I. H. H. 1955. 'The British Ants allied to *Formica rufa* L. (Hym. Formicidae). *Trans. Soc. Brit. Ent.*, **12** : 1-48.

Some Insects (mainly Coleoptera) of the Caldbeck Fells in Cumberland

By W. F. DAVIDSON, F.G.S.

The high mountains, Skiddaw and Saddleback, are not officially part of the Caldbeck Fells, but a glance at the map suggests that the whole area, which lies to the north of the Penrith-Keswick road, is a single unit. Geologically too, the Skiddaw slates, of which they are formed, strengthen the argument, for these rocks extend to the northern flanks of the Caldew valley, which is in the centre of the area. For this reason, I have included the two peaks in question, especially as they harbour many interesting species.

Less visited than Lakeland proper, this large tract of hilly country comprises a central massif of rather more than 2,000 feet, with Skiddaw and Saddleback around the 3,000 feet mark. Streams flowing through radiating valleys are fed by mountain becks which descend steeply down narrow, sinuous gills. These latter are fascinating to explore, especially if one is a mineral collector, for the area is world-famous on that score.

There are many beetles and the frequent miniature cloudbursts, to which the district is singularly prone, provide a rich harvest if one is quick enough. A vast volume of water cascades down the gills and valleys, uprooting boulders and tearing away rushes, moss, and other vegetation. The floods can be up and over in a matter of hours, and it is often a matter of luck if the collector arrives at the right moment.

There are few trees apart from rowans in some of the gills, but Carrock fell has a fair-sized colony of juniper among block scree on its southern slopes. The ground cover is the normal assemblage of mountain grasses and mosses, with large areas of ling and bracken. Bilberry is patchy and not confined to any one altitude. A few widely separated willows grow by the river Caldew, which is the largest stream in the Caldbeck Fells.

My excursions after minerals have taken me all over the district, much of the insect collecting being the secondary motive.

Sallow bloom, being scanty, is keenly competed for in spring, attracting large numbers of diptera, especially Empids, one of the choice species which is common there being *E. verralli* Coll. which vies for nectar with the handsome bee, *Bombus lapponicus* Fab. Various beetles haunt the few patches of shingle along the Caldew, mainly Bembidiinae of the species *tibiale* Df., *atrocoeruleum* S., *redtenbacheri* K.D., and *ustulatum* L. These are all inextricably mixed, and not in separate colonies.

The genus *Notiophilus* is represented, at all altitudes, by *palustris* Df., *aquaticus* L., and *biguttatus* F., the last frequently in a completely black form. Most of my beetles have been taken under stones,

in moss, and among flood refuse. Sweeping and beating have yielded very little of interest apart from the immature specimens of the Hemipteron, *Zircona caerulea* L., whose beautiful blue adults are frequent under stones among the ling of Brandy Gill.

Of the large Carabids, *Carabus catenulatus* Sp. is by far the commonest; *C. glabratus* Pk. is not plentiful, but can be met with anywhere over 1,000 feet. The bronzy *C. arvensis* Hb. is the only other member of the genus that I have taken there and is not at all common, usually encountered crawling about the lower slopes of short turf.

One of the most abundant beetles is *Geotrupes vernalis* L., an insect which is now being devoured in large quantities by the mountain foxes since the demise of most of the rabbits. I have seen Reynard's droppings composed almost entirely of the elytra of the beetle.

Most of my work on *Coleoptera* has been confined to the past two years, a fact which accounts for the many gaps in the list given at the end of these notes.

Stenus guynemeri Dr., *Dianous coerulescens* Gy., and *Quedius auricomus* Kw. are three typical species extracted from waterfall moss in various smaller gills, while Brandy Gill and the nearby Grainsgill have each yielded the elusive *Leistus montanus* S., which I had sought in vain on the high summits.

Pterostichus aethiops Pz. and *P. adstrictus* Df. have not come my way very frequently here although I have taken them freely at lower elevations in other parts of the county. It is interesting to note that few insects occur under the numerous blocks of quartz and other mineralized material, they much prefer the "country rock".

Skiddaw is a much more rewarding mountain than its neighbour Saddleback, and strangely enough, the richest part of the summit of the former has been the lowest (Little Man), which is some 200 feet less in height than the peak. Little Man is frequently bypassed by visitors, whereas the high top is rarely unpeopled in summer—its screes littered with broken glass, tin cans, and all the *rejectamenta* of "civilization".

The lower summit has produced such prizes as *Anthophagus alpinus* F., *Geodromicus plagiatus* F., *G. globulicollis* Mn., and *Acidota crenata* F. during my visits in 1958.

A frequent routine is to take a portable m.v. black-light (short wave) to look for fluorescent minerals, leaving a generator with my m.v. moth trap in hand. This has yielded some interesting moths such as *Ammogrotis lucerneae* L., *Apamea furra* Schf., *Amathes castanea* Esp., *Thera cognata* Thun., with fine dark forms of *Eumichtis adusta* Esp. and Scottish forms of *Scoparia truncicolella* Staint. and *S. cembrae* Hw.

The grass moth *Crambus margaritellus* Hüb. abounds on bogs to the east of the fells along with the pretty hopper, *Tettigoniella viridis* L.

Much more collecting is necessary before it is possible to compile a full insect list for this interesting outlier of the Lake District, but the following is my present list of beetles:—

COLEOPTERA.

<i>Cicindela campestris</i> L.	<i>Q. auricomus</i> Kw.
<i>Carabus catenulatus</i> Sp.	<i>Q. attenuatus</i> Gy.
<i>C. glabratus</i> Pk.	<i>Q. fulvicollis</i> S.
<i>C. arvensis</i> Hb.	<i>Q. boops</i> Gr.

- Notiophilus biguttatus* F.
 (black forms frequent).
N. aquaticus L.
N. palustris Df.
Leistus montanus S.
Nebria brevicollis F.
N. gyllenhali Sr.
Loricera pilicornis F.
Clivina fossor L.
Bradycellus harpalinus Se.
B. collaris Pk.
Trichocellus cognatus Gy.
Pterostichus madidus F.
P. aethiops Pz.
P. adstrictus Df.
P. nigrita F.
P. diligens St.
Abar ater Vl.
Calathus melanocephalus L.
 v. nubigena Hl.
C. micropterus Df.
Agonum ruficornis Gz.
A. gracilis Gy.
Olisthopus rotundatus Pk.
Bembidion tibiiale Df.
B. atrocoeruleum S.
B. redtenbacheri K.D.
B. ustulatum L.
Trechus 4-striatus Sk.
T. obtusus Tr.
Patrobis assimilis Cd.
Hydroporus nigrita F.
Agabus guttatus Pk.
A. arcticus Pk.
A. bipustulatus L.
Anacaena globulus Pk.
Cercyon analis Pk.
Melasturnum boletophagum Mm.
Aleochara diversa Sg.
Ocalea picata S.
Astilbus canaliculatus F.
Atheta
 sub. g. *Metaxya islandica* Kr.
 sub. g. *Oreostiba tibialis* H.
Conosomus lividus Er.
Tachyporus chrysomelinus L.
T. hypnorum F.
T. pusillus Gr.
Tachinus rufipes D.G.
T. marginellus F.
T. elongatus Gy.
Boletobius thoracicus F.
- Staphilinus aeneocephalus* D.G.
Philonthus decorus Gr.
P. sordidus Gr.
Xantholinus linearis Ol.
X. longiventris H.
Baptolinus affinis Pk.
Othius punctulatus Gz.
O. melanocephalus Gr.
O. myrmicophalus Kw.
Lathrobium geminum Kr.
L. fulvipenne Gr.
L. brunnepes F.
Cryptobium fracticorne Pk.
Dianous coerulescens Gy.
Stenus guynemeri Dr.
S. clavicornis Sp.
S. brunnipes S.
S. impressus Gm.
S. nitidiusculus S.
S. similis Hb.
Oxytelus laqueatus Mm.
Anthophagus alpinus F.
Geodromicus plagiatus F.
G. globulicollis Mn.
Lestera longelytrata Gz.
L. pubescens Mn.
L. heeri Fv.
Acidota crenata F.
Olophrum piceum Gy.
Proteinus brachypterus F.
Aphidecta oblitterata L.
Coccinella hieroglyphica L.
Brachypterus glaber S.
Meligathes aeneus F.
Byrrhus pilula L.
Helmis maugei Bd.
Aphodius fimetarius L.
A. ater D.G.
A. lapponum Gy.
A. putridus Hb.
A. rufipes L.
Geotrupes stercorosus Sb.
G. vernalis L.
Serica brunnea L.
Hypnoidus riparius F.
Cryptohypnus dermestoides Hb.
Limonium aeruginosus Ol.
Dolopius marginatus L.
Corymbetes cupreus F.
 v. aeruginosus F.
Cyphon paykulli Gu.
C. padi L.

Mycetoporus brunneus Mm.
Quedius mesomelinus Mm.
Q. fuliginosus Gr.
Q. molochinus Gr.
Q. umbrinus Er.

Cantharis figurata Mn.
Plateumaris discolor Pz.
Lochmoea suturalis Th.
 v. nigrata Wei.
Strophosomus melanogrammus Fo.

9 Castlegate, Penrith, Cumberland, 30.i.1959.

Book Notes

The Oxford University Press is preparing a new edition of the O.E.D. Supplement, and with each number of their house organ, *The Periodical*, they insert a questionnaire asking for earlier references to certain words than those given in the present Dictionary. Among these words in the December *Periodical* are 'allelomorphism' (1913), 'autosome' and 'autosomal' (1929), and 'angle shade moth' (1949). The words used by geneticists should not be difficult to trace to their source; but we confess to a mild shock on hearing that the first mention of the English name of *Phlogophora meticulosa* L. was in 1949. Surely the Angleshades (whether one word or two) was mentioned by Wilkes or Albin if not by Mouffet or Petiver. Can Dr. Lisney or Mr. Howard enlighten us? In any case, 1949 is much too late since Moses Harris in his *The English Lepidoptera*, Svo, 1775, page 43, calls *P. meticulosa* L. "the angled Shades".

The house of Bernard Quaritch Ltd. has just issued another of its interesting catalogues, No. 787. This time it is Botany and it includes British and foreign floras, the science of botany (with some of the latest textbooks), Cryptogams, agriculture, trees and shrubs, fruit and gardening, the last-mentioned including some of the more desirable works on herbaceous and bulbous plants, roses, orchids and cacti. To the field entomologist, who is invariably a lover of plants, as indeed all good men should be, these catalogues are always attractive. Bacon's words "God first planted a garden" spring to mind, and one looks first to make sure that Gerard's Herbal, Andrews' Heaths, Parkinson's earthly paradise, Curtis's magazine, John Evelyn, Farrer and Miss Jekyll are all present. The copy of the *Paradisus Terrestris* by John Parkinson—or perhaps I should write 'Park-in-sun' as he delighted to pun with his name—in this Quaritch catalogue is described as "A good tall copy in old calf rebacked". To the end of time this book will be a constant delight to garden lovers. But it is now an expensive volume—£34. The facsimile reprint, which one can have for ten pounds, is in my opinion a poor thing, being printed on paper which is a deathly white.

Why is it that so many excellent facsimile reprints—Shakespeare folios, Spenser, the *Hypnerotomachia* of Polyphilus (which being interpreted means 'the strife of Love in a dream') and many another, boons to those students who are unable to afford early editions, cannot be printed on papers similar to those of the originals? Many years ago I embarked, with the late Alfred Pollard, on the project of reproducing all Shakespeare's quartos by collotype. After many experiments

Barcham Green made a paper which could not be distinguished from the paper on which the originals were printed, and would therefore have to be watermarked to prevent fraud. That great artist in collogtype Donald Macbeth produced a page on Barcham Green's paper which, after a critical scrutiny by the four of us at the British Museum, was declared to be indistinguishable from the original page; for collogtype reproduces blemishes, fox-marks, dirty finger prints and all. Alas, the deaths of Pollard and Macbeth put an end to all our plans. But although only a single leaf was printed we did actually achieve success. So it can be done—as indeed it is done every week in the case of missing leaves of exceedingly valuable books.

The *Paradisi-in-sole Paradisus Terrestris* was printed by that maker of fine books Roger Norton, whose printing house was at the sign of the Bell in St. Paul's Churchyard. It was first printed in 1629, but it is only during the last fifty or sixty years that its charm and merits have been appreciated at their true worth. The copy sold at the sale of the 5th Duke of Marlborough's library from Whiteknights (at Earley near Reading) fetched but 23s. Still, the fact that Norton considered it worth while setting up the type again and printing a new edition 27 years later shows that the book had a regular if small yearly sale. Poor Norton, his printing house was burnt down not long after 1656, which accounts for the rarity of his splendid folio on heraldry, *De Studio Militari* (which includes Henry Spelmann's *Aspilogia* with the magnificent copperplate portrait of Spelmann by William Faithorne), printed in 1654. Very few copies of this book are known—a census which I once compiled showed less than 40 copies in England and the Continent, most of them being in the college libraries at Oxford and Cambridge and in foreign Universities. Many of these copies have had the portrait of Spelmann cut out by zealous print-collectors. Of my two copies, one came from the library of Sir Humphrey Mackworth at Neath; the pedigree of the other is unknown, but it is beautifully bound in vellum with gold tooling by Francis Bedford, and is the tallest copy known. Both are in what book-collectors call 'mint condition'. But I must stop all this gabbling about fine books and such like things, and remember that the *Record* is devoted to quite other matters.

Notes and Observations

LOCAL HABITS OF *HYDRIOMENA FURCATA* THUN.—In 1955 (*Ent. Rec.*, 67: 264: 15.x.1955) I made some comments on Ford's *Moths*, in the course of which I questioned the correctness of the statement that the July Highflyer, *Hydriomena furcata* Thun., was largely day-flying. My experience of the insect in Surrey before the war and more recently in Middlesex was that it did not normally fly before dusk and that it came to light readily after dark. I had no recollection of seeing the moth flying in daylight, though in Surrey it had been abundant.

My view was immediately challenged by the late Mr. Anthony Thompson, and Mr. P. B. M. Allan also told me that in central Wales the moth flew freely in daylight. A friend in Plymouth also disagreed with me. I noted at the time that these opinions were based on experi-

ence in the west of England and in Wales, and I put the question to several entomological friends as the occasion arose.

From the various answers it seemed that while those with experience in the west country supported the day-flying habit those from the east and south-east were inclined to agree with me.

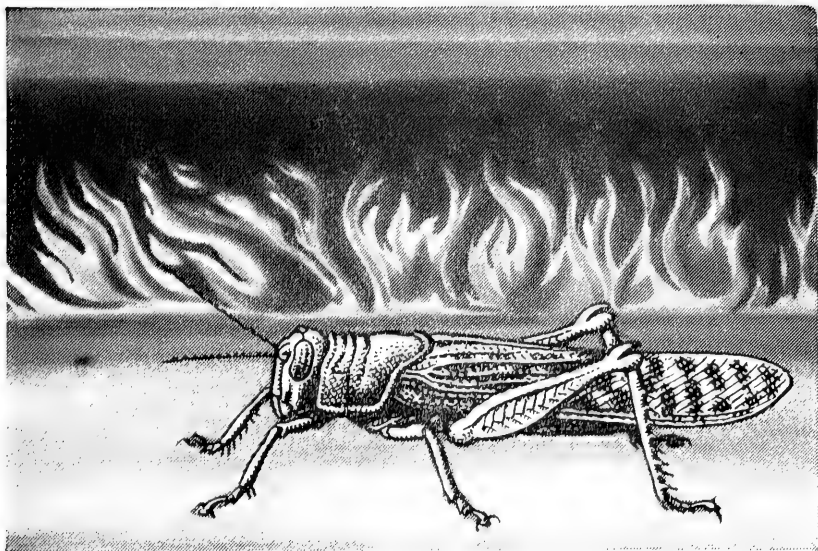
Last August I was on holiday in North Devon and although the weather was so bad that I did not even assemble my net, I did notice a number of geometrids flying in the lanes in daylight and these were *furcata*.

This experience renewed my interest in the habits of this moth. If, as seems from such little evidence as I have obtained, the moth has different habits in different parts of the country, what is the explanation? Does such a difference occur in other species? What is the habit of the moth in northern England and Scotland and on the Continent? Is there any evidence of a zone in which the habit is intermediate between those from east and west? It would be interesting to know readers' views on a moth which must be familiar to most.—W. E. MINNION, 40 Cannonbury Avenue, Pinner, Middlesex. 28.i.1959.

PANTHEA COENOBITA ESP. IN DENMARK.—*Panthea coenobita* is spreading actively in Jutland. I see it every summer at Svejbræk near Silkeborg, in the centre of Jutland, and we recorded it a couple of years ago on Anholt, the small island in the middle of the Kattegat. I remember that Dr. Cockayne once said to me "the conifer feeding insects usually spread very rapidly". But of course I agree with you when you ask "Why?"—DR. SKAT HOFFMEYER, D.D., Aarhus Bispegaard, Jutland. (*in. lit.*, 27.i.59).

PALPITA UNIONALIS HÜBN. IN YORKSHIRE.—A single ♂ specimen of this scarce immigrant was taken at m.v. light in my garden at Wath-upon-Dearne on 5th September 1958. It is of interest to note in this connection that certain other migrants were more plentiful than usual in S. Yorks. during the 1958 season. These include *V. atalanta*, *V. cardui*, *A. ipsilon*, *P. porphyrea*, *P. gamma*, and *P. maculipennis*.—J. HARDCASTLE SEAGO, B.Sc., 105 Racecourse Road, Swinton, nr. Mx-borough, Yorks.

PARASITES OF NOTHRIS CONGRESSARIELLA BRUAND.—With reference to the paper on *Nothris congressariella* on Tresco in *Ent. Rec.*, 71, 33, three species of parasitic Hymenoptera were bred from larvae of this species collected in Tresco, Scilly, during August 1958. These have been identified by the staff of the British Museum (Natural History) and Commonwealth Institute of Entomology as follows:—*Horogenes* sp. (Ichneumonidae)—det. G. J. Kerrich; *Gelis instabilis* (Förster) (Ichneumonidae)—det. J. F. Perkins; and *Apanteles sicarius* Marshall (Braconidae)—det. G. E. J. Nixon. Mr. Kerrich informs me that *Gelis instabilis* is probably always a hyperparasite: the host in this case is likely to have been the *Horogenes* species. *Apanteles sicarius*, Mr. Nixon tells me, parasitises other species of Lepidoptera which feed in spun and folded leaves.—E. C. PELHAM-CLINTON, 34 Craigmillar Park, Edinburgh, 9.



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THE ENTOMOLOGIST'S RECORD AND JOURNAL OF VARIATION

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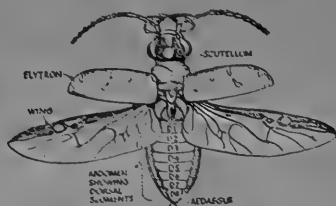


FIG. 2.—*Chindela campestris* L. male. The Common Tiger Beetle.
(Adapted after Ganglbauer)

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Caloptilia sulphurella Haw. var. *aurantiella* Peyer. in Gloucestershire

By J. NEWTON, B.Sc., F.R.E.S.

Caloptilia sulphurella Haw. is generally regarded as an uncommon species in Britain. In Fletcher and Clutterbuck's list of the Microlepidoptera of Gloucestershire, 1938, there is only one old record for Almondsbury. For several years I have found it sparingly in oak woods in Gloucestershire from Daneway to Badminton, but I have not heard of its capture in the north of the county nor in the Forest of Dean, although here there is plenty of oak. It was particularly gratifying, therefore, to find near Tetbury a well established colony containing var. *aurantiella* Peyer. (*remotellum* Hein-Wek.).

While collecting lepidoptera in a mixed wood (mainly oak and birch) in 1953, Mr. A. F. Peacey and I took specimens of a yellowish-brown *Caloptilia* which we could not identify. They had the general appearance of *C. betulicola* Staint., but were smaller, with a violet tinge and with strongly tufted palpi. The only species of the genus with tufted palpi are *C. sulphurella* Haw. and *C. cuculipennella* Hubn. Superficially our specimens bore little resemblance to either of these, both of which occur in this wood, and we were beginning to think we had found a species new to Britain! Later, however, I examined the genitalia of both sexes and could find no difference between these and *C. sulphurella*.

Later that year, in a neighbouring wood which contains much more oak, I found what must be the real headquarters of the form. Here it is quite common, much more so than the type, in fact. The species hibernates and I have seen specimens from August to May since 1953.

Both *sulphurella* and *aurantiella* vary considerably. I have specimens with a pale sulphur, almost white, background and densely covered with black spots. Some specimens of *aurantiella* are densely spotted and others are almost unicolorous deep brown. Oddly enough, in this very variable colony I have not yet met with the form described by Meyrick in his *Revised Handbook* which has "a ferruginous black-spotted median longitudinal streak from base of costa to apex."

The only other report I have of the occurrence of *aurantiella* in Britain is from Mr. L. Price of Stroud, Glos., who captured an odd specimen along with the type at Maenporth, Cornwall, in August 1953.

Dr. Hering first informed me that the form was known on the Continent and had been named. I am also indebted to Mr. S. Wakely who has recently drawn my attention to an account of *aurantiella* by Dr. Spuler (*Die Schmetterlinge Europas*, II Band, p. 410). According to this it is widely known in Europe from Sweden to South France.

11 Oxleaze Close Tetbury, Glos.

Notes on Hepialidae (Lep.)

By Commander G. W. HARPER, R.N. (Retd.), F.R.E.S.

I am spurred by the interesting article from Mr. A. G. Carolsfeld-Krausé on the mating of Hepialidae (*Ent. Rec.*, 71: 33) to record some of my own observations on this rather mysterious Family.

Let me confess at the start that I can come to no definite conclusion either on the vexed question of the males of any of the species being "struck down" by an assembling female. I have never witnessed this, and I too have my doubts, though by no means strong ones, as may perhaps be seen later.

First there is one matter of fact to be considered. The great majority of Heterocera species have the sense of smell very highly developed, and it is much more sensitive in the males than the females; the antennae of the former sex have a larger surface area than those of the females. Such males have been seen by countless good observers to seek out their females, or "assemble" to them, the great Henri Fabre being credited with the discovery that this behaviour is directly attributable to the sense of smell.

The second fact is that there is *no* appreciable sexual difference in the antennal surface area in Hepialidae. I feel that I should perhaps add the word apparent to this statement! I am no expert on insect structures, and my conclusion is drawn solely from inspection under a hand glass. The antennae of both sexes are equally of very much smaller surface area than in the majority of moths of similar size; the inference I also feel to be reasonable—that the sense of smell is slight, is quite valueless to either sex as a means of assembling from any distance, and is probably only of local stimulation value after a pair has found each other. If this is true, then the observer might reasonably expect to find alternative mechanisms operating for the purpose of sex-finding, and it is precisely at this point that the mystery deepens and becomes so interesting.

I have often watched the behaviour of all five of the British species of Hepialidae, but it is some ten years since I saw *H. lupulina* L. and *H. sylvina* L., neither of which occur in the Badenoch district of Scotland. Neither of these, nor *H. fusconebulosa* Degeer, our commonest Swift in the Highlands, have I ever seen "pendulating". Their flight characteristics seem to be common to all three; first, a very brief concentrated flight of large numbers of males at very high speed over and through the grass, heather, bilberry and rushes of their habitat. In the case of *H. fusconebulosa* you can set your watch by them! The males all seem to get on the wing at precisely 10.15 p.m. in my garden, in Newtonmore, and stop instantly at 10.35, still in broad daylight! This is undoubtedly a mating flight, for I have not infrequently found a female being actively courted by the male on following up one of these dashing flights. I think it fair to conclude that in these three species the male is the active seeker for a mate. I think it is interesting to note also that there is a definite tendency with the males of all three species to enter houses at the end of this short flight. Windows are usually open on fine summer evenings (when there are any!) and I have often been invaded by numbers of each of the three species. Lastly, as noted by Carolsfeld-Krausé, a late night flight also occurs. On several occasions when the early part of the night was cold and clear, I have looked in my m.v. trap and seen only a handful of moths. As often happens in the Highlands a pronounced rise of temperature occurs before dawn, and in the morning I have found literally dozens of *H. fusconebulosa* males in the trap. One of these days I must bestir myself and go out before sunrise to see if there is a corresponding short mating flight then! In conclusion, I am of the opinion that the males of

these three species probably find their mates by the technique of covering as much ground as possible by a series of short sharp rushing flights and locate them by exploration of the herbage using vision as much as smell.

Lastly, the "pendulators", *H. humuli* and *H. hecta*. Both of these certainly start to fly sometimes much earlier than the first group. I have often watched considerable numbers of male *H. hecta* in woodland clearings "pendulating" under certain trees well before sunset, and occasionally, by diligent searching, found a female nearby, not always with her mate. On the other hand, on 13th July 1956 my son, M. W. Harper, drew my attention to a very curious sight at precisely 2130 B.S.T., still before sunset. In a clearing among Scots Pine in which much Blue Moor Grass (*Molinia*) was in flower, many of the tall flower stems had each its pair of *H. hecta* in copula, the female clinging to the under side of the curved blossom, the male suspended free and hanging vertically from her. Clearly in this case the mating flight was over. The "pendulating" flight of the males of *H. humuli* is of course even better known, but in neither have I been successful in spotting the actual encounter between the sexes; I see no reason to doubt the tradition however that the flying female, probably using vision, selects her mate from the flickering cloud of males, for I have often netted flying females near a swarm of "pendulating" males, and occasionally found a pair in cop. nearby. I have sometimes taken males of *H. hecta* at m.v. light on the sheet, but never *H. humuli* males, but I suspect that both do have a late flight.

Two or three times I have noted in my diary a curious observation that I have never seen in print; that *H. humuli* sometimes flies in large numbers actively round the tops of tall trees! The first time I saw several large moths in Sussex flying round, over, and through the tops of a row of Lombardy poplars about sunset near my house, I was so intrigued that I fetched my binoculars from the house in order to try and identify them. This proved unexpectedly easy, for the shape of the long wings of *H. humuli* were clearly silhouetted from time to time against the clear Western sky. Unfortunately, I could not determine the sex as the moths appeared dark against the light sky. They were probably males; but what were they doing in so curious a place? I have also once seen the same flight here in Scotland, this time over large Alder trees by the river.

I am sure there is still plenty of scope for further observations on all these interesting species.

18/11/1959. Neadaich, Newtonmore, Inverness-shire.

A New Attraction for Insects

By A. G. CAROLSFELD-KRAUSÉ

A few hundred yards off the coast of Sejroe bay in north-western Sjaelland the sea has thrown up a long row of sandbanks, partly flooded at high water and their higher parts covered by the typical dune vegetation of the North Sea-Kattegat region. Unprotected, placed in the open sea and exposed to the eternal strong westerly winds, rain and showers of the Danish so-called 'climate', they seem to be the last place in the world where Lepidoptera would settle. Urged, however, by the

curiosity which besets the collector, I decided to pay a night visit to the sandbanks in order to study their nocturnal insect life, though I knew that all the odds were against my finding any.

The night I went ashore was late in July 1953; it was dark and very cold, and the wind, which inland had been moderate, blew half a gale from the open sea. I got a strong feeling that my little expedition would turn out to be a wash-out, but to my astonishment I soon saw more than a few moths scooting low down through the herbage. However, the strong wind made them travel with the speed of bullets and it was hopeless to use a net. I decided to make my way home and wait for a less windy night.

Walking across the bank I passed a dense growth of *Elymus arenarius* Linn., and suddenly noticed numerous Noctuidae clinging to its swaying spikes, and an examination of this odd phenomenon showed that the spikes were covered by large viscous drops, which were eagerly imbibed by the moths. I removed a drop with a finger and tasted it; it contained sugar in a very high concentration. The plant tissues were in some way damaged, and the spikes were bleeding on account of the high sap pressure at night, when evaporation is slow on account of the closing of the stomata as the plant transformed the day's production of starch into sugar and distributed it to the various tissues, its nightly job.

I collected a lot of the bleeding spikes for closer examination and counted the number of Noctuids present upon them. On fifty spikes I counted 319 Noctuidae, i.e. about 6 specimens on each bleeding spike. The species present were mostly common dune species with *Agrotis vestigialis* Rott. as the dominant one, and a fair number of *Leucania* species from the coastal swamps; there were also a few wanderers from further inland.

Beside the interesting problem of the cause of the bleeding, it was indeed interesting to learn that so many specimens were on the wing in such a locality under such bad climatic conditions. It was of course no new experience to me as an entomologist, as one knows that lepidoptera take things as they find them, if no better can be found; in 1954, as the Danish "summer" drowned in rain, the *Buddleia* in my tiny garden was visited by butterflies even during rather heavy rain; they had no choice if they were to get the food they needed.

An examination of the spikes later that evening, indoors, showed that the seeds of the bleeding spikes were transformed into a creamy substance which, under the microscope, proved to contain a multitude of a large stick-shaped micro-organism, varying in size from 3×7 to $5 \times 11 \mu$, slightly constricted in the middle, surrounded by a thin mantle of mucus and containing bi-polar spores.

The material was sent to the microbiological laboratories of the Royal Veterinary and Agricultural College for determination. The head of the laboratories, Professor Erik Petersen, informed me later that the phenomenon was unknown to him, as also in all probability, was the micro-organism; this belonged to the *Fungi imperfecti*, but it had not been possible to cultivate it. In this latter respect, two further supplies of material collected during the two following years were failures too, and the cause of this may have been the fact that the material, as I had already noticed during my first microscopical examina-

tion, seemed to be suffering from a heavy infestation of bacteriophages.

As further examinations proved that the fungus was present upon *Elymus* everywhere along the bay, I think the attack is quite a common phenomenon which has been overlooked on account of the fact that the most conspicuous symptoms only appear at night, and it would therefore be as well for collectors to have it in mind, as it might be of assistance in circumstances where our more conventional methods of collecting may not be practicable.

In the daytime, the bleeding does not occur, and the drops dry up in the wind and sun, so that only the slightest traces remain and these are almost invisible. The presence of many small diptera, licking the spikes, however, betrays the nocturnal bleeding, and one can therefore reconnoitre one's hunting ground for this natural sugaring mixture even in daytime.

Collecting Notes and Observations on the year 1958

By S. WAKELY

These notes should have been written some months ago, but I hope they will be of no less interest because of their belated appearance.

Although the season has generally been voted a bad one, personally I found it very productive, chiefly because I pay attention to the microlepidoptera and also to the fact that most of the species I collect in the larval state. However, any of the larger species that interested me were noted, as will be seen by the following.

During the first fortnight in June I stayed at Lydd-on-Sea, adjoining Dungeness, Kent. The weather was unkind, but an m.v. light was used on the few nights that were suitable. The date was too early for many of the better species to be taken in this locality, but just right for *Agrotis cinerea* Hb. a species I was keen on getting from this area. Less than a dozen, however, were taken; due no doubt to the bad weather. The males showed considerable variation, and the two females taken were very dark. I was told that this species is often very common at Dungeness. *Hadena w-latinum* Borkh. was the commonest noctuid at the m.v. on several nights. *H. albimacula* Borkh. was not as common as *H. conspersa* Esp., but both were in fresh condition. Several females of *H. albimacula* were taken at rest on posts during the daytime, but only males came to m.v. Other species taken at m.v. were two female *Macrothylacia rubi* L., one *Heliophobus albicolon* Hb., and two *Caradrina ambigua* Fabr. A single fresh *Eustrotia uncula* Clerck was netted one evening near the large pond.

I quite expected to be able to find larvae of *Lasiocampa trifolii* Scop., but even a conducted tour by a friend in the most likely place failed to produce a single larva. Perhaps the cold wind had something to do with it, but the weather was sunny. Strangely enough one larva was found by Lydd-on-Sea Station about 8 p.m. the evening before I returned home. This duly produced a male which emerged late at night and was in tatters when found the next day. I understand special precautions should have been made to prevent this occurrence.

Mr. J. M. Chalmers-Hunt paid us a visit one day and captured several *Semiothisa alternaria* Hb. at Greatstone. They were all disturbed from the Sea Buckthorn which grows in abundance here on the

small patch of sand dunes, and he suggested that the larvae probably fed on that shrub. This seemed likely as I had taken several *alternaria* a few years previously at Camber, Sussex, where there are large areas covered with Sea Buckthorn. I visited Greatstone at dusk a few days later and captured sixteen specimens of this local species flying over the Sea Buckthorn bushes. The flight lasted about 30 minutes, and stopped as suddenly as it began. The French writer Lhomme gives *Hippophae rhamnoides* as a foodplant of the allied *S. notata* L., and it certainly appears that *alternaria* is breeding hereabouts on this shrub.

A particularly interesting find was the larvae of *Synaphe angustalis* Schiff. Several were found by examining the moss which grows in such abundance on the shingle hereabouts. This moss was pulled up in handfuls and well shaken over a piece of paper, when the large black larvae were easy to see when present. They are very similar in appearance to the larvae of *Pyralis glaucinalis* L. *S. angustalis* swarms here in July, but few people have ever seen the larvae.

Numbers of spun tips of Sea Buckthorn were observed, and the commonest larva present was *Cacoecia rosana* L. which is green in colour with a black head. This species was also bred from elm and bramble leaves. Other moths bred from spinings on the Sea Buckthorn were *Spilonota ocellana* Schiff. and *Argyroplote urticana* Hb., while a few larvae of *Euproctis chrysorrhoea* Hb. and one *Lasiocampa quereus* L. were found on the same foodplant.

Micros were scarce at m.v., the best being some pale forms of *Scoparia dubitalis* Hb. (ab. *ingratella* Knaggs) and one *Monopis imella* Hb.

Larvae of *Unephasia longana* Haw. occurred in vast numbers on a host of different plants. They were to be found in the blossoms of a common yellow-flowered Hawkbit, in spun flowerheads of sorrel, as well as on broom, willow, blackthorn, and sea buckthorn. Larvae of *Peronea variegana* Schiff. were common in spun shoots of the stunted growths of blackthorn, and produced a wonderful selection of varieties. *P. comariana* Zell. larvae on *Potentilla palustris* were mostly parasitized, but a few moths were bred.

The willow round the ponds produced many larvae in spun shoots. The commonest was undoubtedly *Eucosma semifuscana* Steph. which occurred in thousands, almost every spun shoot containing the pale grey larva of this extremely variable moth. Of about fifty which I bred two were the striking black and white variety. There were a few larvae of *Peronea hastiana* L., all of which produced small-sized melanic forms. Some *Eucosma cruciana* L. were also bred, including two greyish forms with none of the characteristic bright red markings. Can anyone tell me if *E. angustana* Hb. is a distinct species or is it a colour form of *cruciana*?

Webs of the larvae of *Gelechia suppeliella* Wals. could be found wherever *Rumex acetosella* grew on the shingle. These webs are not conspicuous, but easy to see when the plant is examined at close quarters. The easiest way to procure the larvae is to pull up the whole plant with web attached and place it on a sheet of paper. The black larvae are very active and jump out of their webs if the action is not done quickly. A few larger plum coloured larvae were also found, and these proved to be *Gelechia diffinis* Haw.

On the *Silene maritima* larvae of *Phthorimaea leucomelanella* Zell.

could be found by careful searching, usually in the terminal shoot with the two end leaves spun together, the larva appearing to feed chiefly on the pith of the stem from which the leaves were growing. From larvae beaten from broom single specimens of *Gelechia mulinella* Zell. and *Depressaria scopariella* Hein. were subsequently bred, and no doubt both were common as I only sampled a single spray. Never have I seen larvae of *Depressaria costosa* Haw. so common as they were on the gorse bushes. By placing a net under an overhanging branch and shaking vigorously the larvae were persuaded to descend in numbers. They varied from green to brown and at the time I thought I was getting more than one species, but they were all *costosa*. A search was made for larvae of *Depressaria badiella* Hb. on *Hypochoeris radicata* as the moth is not uncommon here in July, but once again I was unable to find the elusive larvae of this species. Larvae of *Coleophora otitae* Zell. were quite common on *Silene nutans*, but were usually found in the vicinity of leaves showing the conspicuous white feeding places, often half buried in other herbage, and seldom on the *Silene* leaves. For some reason none of mine emerged, although they fed for some time after capture and I was able to supply fresh foodplant from my garden at home. In previous years I had had no trouble with this species which as far as I know only occurs in Britain at Dungeness. Larvae of *Coleophora discordella* Zell. were very local along a short strip of *Lotus corniculatus*, the white leaves on which the larvae had fed betraying their presence.

Most of these notes have been taken up by these Dungeness records, but I would like to mention a few of the species which were taken at m.v. in my garden at Camberwell, not so much because of their rarity, but for the fact of their occurring in such a built-up area. The most unusual were: *Euzoa nigricans* L., *Cosmia affinis* L., *Scopula marginipunctata* Goeze, *Perizoma flavofasciata* Thunb., *Cleora repandata* L., *C. rhomboidaria* Schiff. (melanic), *Dioryctria fusca* Haw., *Euzophera neophanes* Durr., *Crambus uliginosellus* Zell., *Gypsonoma neglectana* Dup., *Polychrosis fuliginea* Schiff., *Eucosma ratzeburgiana* Sax., and *Nepticula decentella* H.S.

Larvae of *Euzophera neophanes* Durr. were not uncommon in Surrey at Horsell Common in May on the fungus *Daldinia concentrica* and I also found some at Chobham Common and Farley Heath.

Several trips were made to Ashdown Forest in a fruitless search for larvae of *Depressaria prostratella* Const. following Mr. Fairclough's capture of a moth there the previous year. A number of a *Depressaria* larvae were found in webs on *Ulex minor* and these kept us in suspense until the moths emerged and proved to be only *umbellana* Scop. On one visit several larvae of *Peronea mixtana* Hb. were found on *Oalluna vulgaris*. These green larvae spin several twigs of Ling together into a fairly conspicuous bunch and seemed to prefer the tallest plants. A later trip was paid to this district when I was shown an area where the Marsh Gentian was growing, a truly wonderful sight. Another rare plant pointed out to me was *Genista pilosa*. On this occasion a number of larvae of *Peronea hastiana* L. were found on willow and these produced some very good varieties. An interesting find was the larva of *Ancylis inornatana* H.S. on *Salix repens*. A number of leaves were found with the edges bent downwards, forming the leaf

into a tube-like structure. At the time I thought they were *Lithocolletis quinqueguttella* Stt., but on looking at the leaves a few days later it was evident by the quantities of frass present that there were fairly large larvae in these leaves. Luckily they went on feeding on ordinary willow and finally two *Ancylis inornatana* emerged in September, thus clearing up the mystery. The remaining larvae went into hibernation.

Some Notes on *Poecilocampa populi* L.

By H. SYMES

The December moth (which I have never bred or taken later than 30th November) is one of those species of which it is not easy to obtain females in any number. It would seem that last year was a bad season for the species. Two friends who are short of females informed me that not even a single male visited their light. Brigadier Warry took one female on 27th December but it did not lay any eggs. He thought—no doubt rightly—that they had already been deposited. In the ordinary way it is hard to obtain females except by breeding, for they do not often come to light, and I have only once found a wild one in the day-time. It was sitting on a brick wall close to a street lamp outside the house at Wantage where I was living.

The males come freely enough to light of any kind. I remember walking through a wood in east Somerset carrying an old fashioned bull's-eye lantern, to which a number of males were attracted, and when I shone the feeble light on the back of my companion, a parson who was wearing an old black overcoat in the early stages of turning green, the moths eagerly settled there and I boxed them without difficulty, much to the enjoyment of my friend. In this wood the larva was more plentiful than in any other locality which I have worked. I obtained most of mine by beating, but also found a few nearly full-grown ones stretched out at full length on the trunks of trees. In recent years I have never beaten more than two or three larvae in a season, and when I obtained two a few years ago, I was lucky to breed a female imago from one of them.

I have not found the moth at all easy to rear from the egg. My first attempt was after I had obtained a pairing with moths bred from larvae beaten from oak, or found on the trunks of oak, ash and aspen. When the eggs hatched on 1st May, I fed the larvae on hawthorn. I do not remember why I gave them this pabulum, which had certainly not been the food of their parents. Probably the larvae themselves selected it from a choice of leaves offered them. Anyhow, they fared well enough at first, but in their third or fourth instars they all died.

My second attempt was two years later, after I had obtained a pairing which yielded exactly 100 eggs. I kept half of these indoors and half outdoors. The former hatched on 19th April and the next few days, the latter on 24th April and the days following. Again I started feeding the larvae on hawthorn, but on 5th May oak was substituted. They grew slowly while eating hawthorn, and rapidly when switched on to oak. They all did well until they reached their last instar, or were preparing to change into it; then all died of disease except two, which spun up about 10th June. One moth, a female, emerged on 17th November.

Another two years later, I obtained 64 eggs, half of which hatched between 1st and 5th March. I fed the larvae on split oak buds until the leaves appeared. Seven spun up between 2nd and 7th May, a very early date. Four moths emerged, of which one was a female.

So far I had bred only five moths in three attempts. I had better luck from the wild female that I found at Wantage, which laid more than 100 eggs in long rows on the side of a breeding cage. These hatched between 25th and 28th April. The larvae fed up well, but unfortunately my notes do not specify their food; writing from memory, I think it was oak. A number of larvae spun up between 8th and 14th June, and nineteen moths emerged between 15th October and 20th November, of which five were females.

Most of the larvae that have come my way were beaten from oak, which I have come to regard as the most usual food, but as stated above, I have found the larva also on trunks of ash and aspen, and not long ago I beat one from maple. Larvae found on tree trunks have always been in their final instar. They adopt a vertical position, and look as if they were sunning themselves, although the tree trunk may well be in the shade. Other species of larvae which I have found similarly placed on tree trunks, and always, I think, in their final instar, are *Griposia aprilina* L. and *Orthosia munda* Schiff., in late May or early June, and *Lymantria monacha* L. about a month later. Once I saw a friend find a huge larva of *Catocala nupta* L. on the trunk of a black poplar.

52 Lowther Road, Bournemouth, Hants. 4.III.1959.

Notes on the Microlepidoptera

By H. C. HUGGINS, F.R.E.S.

Nephoteryx similella Zinck. The editor's note on this moth (*Ent. Rec.*, 71: 57) has suggested to me that a further note on its early history may be interesting.

Apart from the few records in 'Barrett' I do not think that anything was known of the moth as British until June 1928. In that year I was collecting at Yarmouth, I.o.W., and was lucky enough to find *Euzophera neophanes* Durr. commonly on some burnt furze bushes about a mile from the town. At that time *neophanes* was considered a very rare insect; apart from a few taken by the Rev. J. W. Metcalfe and Mr. Morgan near Torquay about 1920, its capture was almost legendary. As I knew several of my friends were staying at the Beaulieu Road Hotel I ran across to see them on June 13th to tell them of my luck. I found there A. R. Hayward, G. B. Coney and the Rev. A. P. Wickham, all no longer with us, and Mr. L. T. Ford. Directly I got there they showed me seven moths that had come to petrol vapour lamps in Denny Wood the previous night; we none of us recognised them, but a few weeks later they were identified as *similella*. The place at which they were caught was a small clearing of about 30 × 20 yards in size, surrounded by lofty oaks. The sheet was placed on the ground, and all the moths came in a short time about midnight, after a terrific downpour of rain. The place had been worked for several nights previously and it seemed obvious that the insects were inhabitants of the tree-tops and had been dislodged by the rain.

No more were taken that year, but on two visits in 1929 Hayward, who lived at Misterton in Somerset, and ran over to the New Forest when a good night seemed likely, took three or four more in the same place.

The late William Fassnidge and I determined to get the larva, and in late August in 1929 and 1930 we beat all the oak boughs attainable, without success.

In 1930 I tried for a week in June at Hayward's place with a ground sheet and petrol vapour lamp without any luck, and determined to try again in 1931. I therefore went to the Beaulieu Road at the beginning of June and again worked the old place, but the nights were rather cold and clear and I still had no luck. On the night of 11th June, however, it was muggy and overcast, and as my friend, Captain Cyril Driver, and his son, Paul, had joined me I determined to make a late night of it. There were a large number of moths about, including a good many *Drymonia trimacula* Esp. and *Boarmia roboraria* Schiff., so we stayed till after 1 a.m. on the 12th. Just as we were thinking of packing up I saw a small dark insect drop on the sheet, apparently from the sky. I looked at it and found it was a perfect newly emerged *similella*. The moth was rather lively and I was in a state of high nervous tension; it kept making short flights of about six inches on the sheet, and when eventually I managed to pop a box over it I was unlucky enough to make a slight scratch in the cilia of the right wing, otherwise it was in bred condition.

Mr. L. T. Ford about the same time was lucky enough to breed one from a pupa found at the foot of an oak at Bexley, Kent; apart from this I know of no other pre-m.v. records except for one taken by Lt. Col. Manley at Minstead and given by him to Fassnidge, and one or two in mid-Sussex.

Nowadays the moth seems not uncommon in several of the southern counties; I even took one here in my garden at Westcliff on 10th July 1956 (a poor male) but so far as I am aware the larva and pupa have never been found and all the moths including the one mentioned have come to m.v.

I think it is evident that, as Mr. Jacobs says, it is an inhabitant of the tops of the oaks and except when dislodged by a heavy shower or wind does not descend to the lower levels. Mr. Ford's pupa almost certainly came from a larva blown out of a tree which was so near cocoon-spinning that it did not re-ascend, otherwise moths must surely have been seen on the trunks shortly after emergence in places where it is not rare. My garden capture, however, suggests that like many other Crambids and Phycitids it is addicted to night wanderings at a good height.

Phtheochroa schreibersiana Fröl. Discussing the habitat of *N. similella* has reminded me that on 18th June 1923 I was walking along a road fringed by lofty elms at Iwade, near Sittingbourne, Kent, when I saw a small dark moth rising from the ground towards the trees. I netted it and found it was *schreibersiana*, the only one I have ever taken. There had been a high wind with rain the night before, and I thought at once that it had been blown from a higher level and was now returning, as although this road was a favourite walk of mine I had never seen the moth in the past five years. W. G. Sheldon subsequently told

me that the only time he ever took the insect was after a big storm at Wicken when he netted a fair number under precisely similar circumstances under the elms on the path leading to the Drove. My capture is, I believe, the only one known outside the fen district, but it suggests that the moth should be sought at the m.v. in marshy districts, preferably on the lower foot-hills and that it is not so local as is usually supposed.

A Morning in Pembrokeshire collecting Diptera

By L. PARMENTER

On the last day of July 1948 I arrived in Haverfordwest, after travelling overnight from London, to find that I had a few hours to spare before transport arrived to take me to Dale Fort. Little had appeared in print on even the common flies of this Welsh county so a small collection was made.

Walking along a shaded footpath, hedged on both sides, more than twenty *Empis livida* L. were found. One pair coupled, the female holding a female Chironomid as prey. Another *livida* had as its prey a female *Musca autumnalis* Deg. As I had noted elsewhere this species of Empid appeared to favour the shady side of the lane. Over forty *Melanostoma scalare* (F.) were seen, also *Tetanocera elata* (F.), *Oscinella nigerrima* (Mcq.), *Nemopoda nitidula* (Fln.), *Beris geniculata* Curt. and such flies of widespread distribution as *Melinda caerulea* (Mg.), *Muscina assimilis* (Fln.), *Egle aestiva* (Mg.), *Polietes lardaria* (F.), *Mesembrina meridiana* (L.), *Lyciella decipiens* (Lw.), *Chrysotus gramineus* (Fln.), *Sepsis cynipsea* (L.), *Scatophaga stercoraria* (L.) and a Pipunculid at present undescribed bearing but a manuscript name of Mr. Collin's. In their usual haunt, on the top leaves of the herbage in the lane, crouched many males of *Hylemya strenua* R.D.

A pasture was entered from the lane and here were found many fresh, moist pats of cow dung on which were many females of *Mesembrina meridiana* (L.) and *Orthellia caesarion* (Mg.) and on slightly older and drier dung were numbers of *Scatophaga stercoraria* (L.) of both sexes. All three are known as breeders in this medium. In the field about the ruins of a priory were lime trees, the leaves bearing honey dew. The most abundant fly on these leaves was the Stratiomyid—*Microchrysa flavicornis* (Mg.). Other flies noted were *Cheilosia paganus* Mg., *Philophylla heraclei* (L.), *Palloptera ustulata* Fln., *Sepsis cynipsea* (L.), *Liriomyza strigata* (Mg.), *Chrysotus gramineus* (Fln.), *Sargus flavipes* Mg.—and the Empididae—*Platypalpus pallidiventris* (Mg.), *P. extricatus* (Coll.), *P. minutus* (Mg.), *P. calceata* (Mg.), *Empis albinervis* Mg. and *Drapetis ephippiata* (Fln.).

Where trees overhung a wide ditch in the lane, on the leaves were found the Dolichopodidae—*Syntormon pallipes* (F.) var. *pseudospicatus* Strobl, *Hyppopyllus obscurellus* (Fln.); and among the Empididae—*Ocydromia glabricula* (Fln.), *Hilara litorea* (Fln.), *Platypalpus pallidiventris* (Mg.); the Sapromyzidae—*Lyciella rorida* (Fln.) and *Tricholauxania praeusta* (Fln.); and among others *Dryomyza flaveola* (F.) and *Azelia macquarti* (Staeg.).

The population of the fields and lanes was noticeably composed chiefly of the species breeding in animal dung and of predators of aphides.

These last included Empididae such as the species of *Platypalpus* and the Syrphid *Melanostoma scalare* whose larvae kill aphides. The leaf miners—the Agromyzid *Liriomyza strigata* (Mg.) that attacks so many herbs and the Trypetid *Philophylla heraclei* (L.), the pest of the leaves of the Umbelliferae, accounted for most of the remaining flies collected.

The flower visitors were mostly Syrphidae:—

Syrphus vitripennis Mg. at wild carrot *Daucus carota* L.

S. balteatus (Deg.) at dandelion *Taraxacum officinale* agg., bramble *Rubus fruticosus* agg., hogweed *Heracleum sphondylium* L., knapweed *Centaurea nigra* L., hedge-parsley *Torilis japonica* (Houtt.) DC., spear thistle *Cirsium vulgare* (Savi) Ten.

S. corollae (F.) at wild carrot.

S. ribesii (L.) at bramble, wild carrot, hedge parsley *Torilis japonica* (Houtt.) DC.

Melanostoma scalare (F.) at herb Bennet *Geum urbanum* L., agrimony *Agrimonia eupatoria* L., and taking pollen of *Bromus mollis* agg.

Platycheirus albimanus (F.) at ragwort *Senecio jacobaea* L.

P. manicatus (Mg.) at knapweed *Centaurea nigra* L.

Pyrophæna granditarsa (Forst.) at hogweed *Heracleum sphondylium* L.

Chrysogaster solstitialis (Fln.) at hedge parsley *Torilis japonica* (Houtt.) DC.

Rhingia campestris Mg. at knapweed, herb Robert *Geranium robertianum* L., hedge woundwort *Stachys sylvatica* L. and bugle *Ajuga reptans* L.

Eristalis pertinax (Scop.) at hogweed and bramble.

TABANIDÆ

Haematopota pluvialis (L.) a male at creeping field thistle *Cirsium arvense* (L.) Scop. where it was killed by the Thomisid spider *Misumena vatia* (Clerck).

TRYPETIDÆ

Xyphosia miliaria (Schrank) at creeping field thistle *Cirsium arvense* (L.) Scop.

LONCHÆIDÆ

Lonchæa flavidipennis Zett. at wild carrot.

TACHINIDÆ

Bithia spreta (Mg.) at wild carrot and yarrow *Achillea millefolium* L.

Macquartia praeifica (Mg.) at wild carrot.

Zenillia vulgaris (Fln.) at wild carrot.

CALLIPHORIDÆ

Melinda anthracina (Mg.) at bramble.

MUSCIDÆ

Musca autumnalis Deg. at wild carrot.

Orthellia caesarion (Mg.) at ragwort *Senecio jacobaea* L.

Morellia aenescens R.D. at wild carrot.

Gymnodia humilis (Zett.) at wild carrot.

Nupedia dissecta (Mg.) at wild carrot.

On taking *Apatura iris* L. with some mention of *Acronicta alni* L.

By C. M. R. PITMAN

In the February issue of the *Record* (pages 52 and 57) there were two items that recalled certain incidents to my mind. The first was a mention of *A. iris*, and although it was obviously fiction I have known similar incidents which actually occurred.

Some years ago when my friend the late A. G. Peyton, a keen and successful collector of his day, came at my request to do some collecting in one of my favourite localities, he had parked his car at the entrance to one of the main drives through the wood, and while he was engaged in some preliminary activities such as assembling his net for the fray, collecting his gear from the car, casting a glance or two around the area, he was amazed to see a fine male *iris* sitting on the wing of his car. Immediate action, which included some wild swings with the net, resulted in one of the sticks of the net parting company with the Y piece, thus rendering it temporarily useless, and at the same time it practically knocked off one of the side lamps. Whereupon the *iris* sailed gracefully up to the top of an oak, where it sat and surveyed the hectic scene below, no doubt listening with interest to a barrage of expletives not to be found in the Oxford Dictionary.

As a sequel to this episode, not to be denied his prey, Peyton visited the scene of this engagement the following day. Unfortunately, it was dull with some intermittent drizzle, so he was obliged at times to sit in his car and wait, ready to meet his imperial highness should *iris* condescend to put in an appearance again. While waiting for a break in the clouds Peyton was looking out of the car window when, to his utter surprise, there in front of him was a female *iris* not in the least perturbed but sedately occupied with her business of egg-laying. Did he . . . ? No, of course he made no mistake this time, and he got the eggs as well.

This performance, or at least the first part of it, was practically repeated a few years later when another of my friends, N. H. Moody, a local collector at that time, came to visit the locality also in quest of *iris*. Following Peyton's example, he parked his car in almost the same spot and before he had time to prepare for action there was a perfect male *iris* sitting on the bonnet of the car. After a hasty scramble and some wild strokes with the net, one of which nearly enveloped the bonnet, the royal visitor glided up to the tree-tops to gaze in wonder at the confusion below. On yet another occasion when Peyton was collecting in the locality with Baron de Worms they had the thrill and by now the almost expected pleasure of seeing *iris* flying gaily round the parked car, and again the dreadful experience of missing yet another inquisitive emperor. The moral of all this is obviously that a car is a fairly safe place for a butterfly to play around.

Incidentally the first *iris* that I ever caught was in this area and it was taken in a most unorthodox manner. It also gave me my first intimation that the species existed there. I was cycling along a road that runs by the side of the wood when right in front of me a male *iris* descended, or rather floated down from above, and settled rather

indecorously upon some fresh horse droppings. "What a pity there are not so many horses on the road to-day" I thought, falling off my bicycle rather than dismounting. I was in a fix as to what to do as I had no entomological gear with me—this was in my early days of collecting and I was not yet conversant with the unforeseen when entomologising, nor did I possess the equipment to carry around for such unexpected contacts, for instance, a folding net or a nest of glass-bottomed boxes. So the immediate problem was how to deal with so vital a situation. How could I take this valuable insect which had such a depraved taste as to sit there sipping nourishment from such an unsavoury meal?

There was only one thing to do: as I was not even wearing a hat it would have to be taken by hand. Now, it is often quite easy to snatch a sitting insect such as a Red Admiral, Peacock or Painted Lady from a flower-head by this humble yet perfectly natural method, which is carried out by a quick upward flick of the hand, which, but not too tightly, closes over the insect immediately it is within; in fact, I have caught many good things in this manner, some of which are in my cabinets to-day. But this was no ordinary butterfly. This was a prize which previously I had seen only in my dreams and it was not sitting on a flower as it ought to have been. So the problem was even more difficult to solve. Approaching it stealthily, being careful not to let my shadow fall across it—it was late in the day and the shadows were lengthening—I crept slowly but surely to within striking distance, and still his highness continued to sup, completely oblivious to my nearness to him.

Encouraged by this complete disregard of my presence I carefully reached out my hand—and then found myself ignoring my usual method of making hand captures. Instead, I approached with opened thumb and forefinger, and upon reaching my objective there was a quick nip and the mighty emperor was overthrown. It was mine. Actually, there was no need to have hurried the proceedings at all as the butterfly was quite unperturbed the whole time. Having secured my prize I had to kill it, which was done by a pinch in the thorax. Then arose the problem where to put it for safety, for I yet had far to go on my bicycle. Happily, one thing I did carry around with me in those early days was a matchbox—hardly a fitting receptacle for royalty but needs must when a Purple Emperor drives, so it had to do. That first specimen is in my collection now and still is one of my greatest treasures.

Little did I realise that this chance capture would lead me in years to come to meet some of the most prominent collectors of my time, many of whom have turned out to be valued friends, and that this very rich entomological territory, unknown until then, would become the annual trek of entomologists for many years. Not quite so happy a result of this capture is that the shallows would be beaten and scarred each spring until the present day and that for many years collectors young and old would parade the drives with nets long and short and that the drives would be decorated (?) with carcasses in varying stages of decay. Oh, what a price *iris* has to pay for being famous! Pity the poor emperor in spite of his regality among the British butterflies!

It really is surprising how swiftly but surely the 'bush' system of entomological communication travels: it was remarkable how quickly

collectors responded to this heaven-sent information, equalled only by the excursions to Ham Woods for Clifden Nonpareils. Take, for another instance, the history of *Oria musculosa* in the 1930's. Hitherto, this insect was popularly believed to be a rare immigrant, and when it became known that it was appearing regularly in the Salisbury district the knowledge at once resulted in a mass invasion of lepidopterists, stalking over the stubble fields round Salisbury during July and August; for the secret of *musculosa's* flight now became widespread; and so another little-known collecting ground was put on the entomological map.

As a result of this influx of lepidopterists there appeared subsequently in the *Record* (vol. 52 (1940), pp. 37-43) a most interesting article wherein the authors (Drs. Cockayne and Kettlewell) claimed to establish the species as being indigenous to Britain. But to me it has always seemed a pity that in what was largely a hypothetical conclusion concerning the habit and status of *musculosa*, which included much information gleaned from references published at home and abroad, no reference was made to some of the 1920 issues of the *Wilts. Arch. and Nat. Hist. Mag.*, wherein I had already expressed an opinion, with some interesting facts, that *musculosa* was already indigenous to Wiltshire. After all, it was occurring regularly there at the time, and surely it would have been logical to seek some local information and references when engaged upon writing a history of a local species. However, that is another story; so to continue my reminiscences and experiences with *iris*.

It is not really surprising that unexpected and chance meetings with this insect have favoured me in view of the fact that I received my entomological initiation and future entomological contacts through the aforementioned chance meeting with *iris* in the road. Also this experience taught me to be prepared in future, a maxim that has proved its worth many a time since.

Another extraordinary meeting concerns the time I was on a sugaring expedition with Peyton, when we were in search of *Catocala promissa* in a wood not far distant from my *iris* locality. We had arrived at our destination just before dusk and after a general survey of the area we decided to leave our car near the edge of the wood, which seemed a likely place to use a petrol lamp. So we made ready and got the light going, spread out the sheet, and placed the lamp in the centre. All set, we made off to the wood to begin sugaring a run of about 50-60 trees, arriving back at the lamp about an hour later. Lo and behold! Sitting there on the sheet majestically and impassively was a male Purple Emperor! But this time I was prepared for any emergency, and was already armed with a net, previous experiences having taught me that discretion was the better part of entomologising no less than of valour. So I refrained from the professional use of a glass-bottomed box for so valuable a prize. Obviously, the butterfly had objected, and rightly so, to having its slumbers disturbed by the glare from a lamp which in all probability had been placed immediately beneath the royal demesne; so naturally his highness dropped in to protest. Alas! another *iris* came ignominiously to an untimely end.

So to another *iris* day when a gamekeeper with whom I was very friendly—you must never make an enemy of these brethren of the

woods—and with whom I had had many pleasurable afternoons' shooting, called to me to come into his garden to see a large butterfly flying with others over his Buddleia. There to my surprise, dancing nonchalantly amongst Red Admirals, Peacocks and a few Painted Ladies, was a noble female *iris*, which the keeper had already tried to capture unsuccessfully for me by using his hat; however, it was not long before it was fluttering in the bag of my net.

A year or two later, after escorting the Rev. W. Freer on an entomological-cum-collecting trip to my district, during which time he took many insects of interest to him, he jokingly suggested that we might round off the day by taking *iris*. Almost as jokingly I replied that we might, and that it could be possible, but warned him that *iris* was a most unpredictable insect. So we got into the car and went to my favourite *iris* locality. On reaching the wood it was getting latish; the sun was already low, so we decided to work the top end of the main drive which catches the late sun, where also is an old duckpond that absorbs drainings from cow and pig pens. There I bade him wait on one side, prepared for anything to happen, while I took up my position opposite. Within a few minutes I saw a large butterfly flying over. Out of the corner of my eye I glimpsed it soaring, and making a wild backward sweep with the net, miraculously collected a female *iris*. She was kept for eggs, treated royally, and fed on the best a bottle and honey could provide; but she steadfastly refused to lay. Even when sleeved out on a healthy growing sallow she declined to oblige and, regretfully, ended her days somewhat the worse for wear with a chip here and there and some badly rubbed plumage. Nevertheless, she still holds a place in my collection.

Only too well do I remember another *iris* episode in which I was once again in the company of a 'learned clerk', this time the Rev. W. R. A. Addison, V.C., who, during the early 'thirties, was chaplain at Bulford camp and a collector of no mean ability. He had called on me one afternoon and we had arranged to go out collecting in the local woods. It was not long before we had reached once again the ever popular *iris* drive, but no sooner had we entered it than I found myself almost flung against the windscreen of the car which was careering wildly over the verge and halfway into the wood, all because my friend had seen *iris* floating down into the road in front of him. So he swerved and slammed on the brakes 'regardless', and our trip almost ended in disaster for the hunters. In spite of almost an hour's wait around the spot we did not see it again. This may have been fortunate, for I was not in a fit state to wield a net for some time afterwards.

Another unsuccessful episode in my *iris* memoirs concerns the one I saw sitting on a telegraph pole by the side of the main Southampton road just about a foot out of reach of my net, in any case in a very awkward position for netting but really in a most tantalising situation. After gazing at it for a while I hastily cut another longer stick to replace my net-handle and then made a desperate but futile effort at netting. After my wild miss *iris* sailed into an oak about thirty feet high, and although I could see it quite well all my attempts to disturb it by throwing various missiles into the tree failed to ruffle the dignity of this emperor.

Dear me, once started on tales of *iris* each specimen in one's posses-

sion (which in my case is not more than a dozen) revivifies an epic performance as you proudly exhibit your treasures to your somewhat bored audience and relate the fantastic story of its capture, completely oblivious to their indifference. Your latent enthusiasm heaves within your breast and you relive every moment of the capture; and, of course, there are some stories to relate of the others that got away, and although these outnumber by far those that fell to your skill with the net or lucky chance captures, they are still unforgettable memories in your collecting career.

But enough of these reminiscences about *iris*; now I must tear myself away from the emperors and get to the other point which I mentioned as occurring in the February *Record*, namely the observation of Mr. Fairclough concerning *Acronicta alni* and his suggestion of the possibility that this species may be a tree-top dweller. In my district *alni* has always been regarded as a rare insect, being very elusive; and in fact apart from recent years when collecting with m.v. light (which, in my humble opinion, has taken the romance and thrill out of collecting) I had never taken all told, more than half a dozen of this species in my thirty-odd years of collecting in this area. Incidentally this is a remarkably good district for lepidoptera, as in the latter years has been shown by the influx of collectors who annually visit the local collecting grounds. Yet in all these years, which constitute some of my most arduous collecting efforts, I had only ever taken five *alni* larvae and I am sure it was not just coincidence that each of these captures had been made by finding the caterpillar as it was crawling along the ground.

This, to me, seems a rather significant fact, as we know that the larva of *alni* normally pupates in rotten wood, usually on some part of the tree and not in the earth. Another significant point is that all the larvae without exception have been found after very severe weather. For instance, an extract from my diary under date 29th July 1956 reads "found *alni* larva on the ground, Pepper Box Hill; the previous night had been very windy and rough". Another extract reads "*alni* larva from Iris locality crawling along the road, 4th August 1932; on previous night a severe thunderstorm". Other larvae, found in 1927, 1935, and 1944 were also picked up from the ground after periods of very rough weather. Now, had any of these larvae been knocked off a tree by predatory birds the birds would most likely have followed them to the ground and eaten them.

These scanty records of larvae over the years would appear to afford some evidence to support the suggestion, or one might almost say conclusion, that *alni* has long existed and bred in this district, but because of its unusual habit, of which there would seem to be no doubt, of being a tree-top dweller, it has been overlooked and consequently always considered a great rarity. In fact, the insect might have passed completely unnoticed had it not been for finding the larvae, which I am sure must have been dislodged from a lofty position in a tree. However, this erroneous estimate of its status and distribution in Wiltshire (and probably elsewhere) has now been shown to be amiss as we have recently learned by the continued appearance of *alni* at mercury vapour lamps over a very wide area. From my own and other observations it seems, therefore, that the best way to go beating for *alni* larvae would be to equip oneself with a twelve-foot extending pole, plus a few extra exten-

sions such as one would hopefully employ, but with little chance of success unless one was a remarkably fine contortionist, when seeing an *iris* basking in a tree-top

Of course one has interesting stories about the finding of *iris* larvae as well, but I really must put an end to these reminiscences or I shall find myself wandering back again to the Iris drive and relating further episodes of this truly irresistible butterfly, worthy indeed of the name Emperor even if only for the evergreen memories which its name recalls.

An Entomologist in Yugoslavia

By RALPH L. COE

(Concluded from page 49)

I continued my walk along the shores of the beautiful Plitvice Lakes. Still the rain teemed down. At last, however, I saw a prospect of doing some collecting. Strange as it may sound, the promising place was actually under a magnificent waterfall that tumbled from one lake into another. A narrow ledge ran out from the shore to where the moss-covered rock-face receded from the falling torrent. I crept out carefully. Once under the solid sheet of water I was only troubled by a fine spray that dappled the moss with shining globules. On the moss were a number of Tipulidae. As it was impossible to wield my net in these conditions I used fairly wide glass tubes to catch them. Clapping the tube over a fly, I then gently pushed it down to the bottom with a very small plug of cotton wool. The tube was then placed over another specimen, another plug added, and so on until the cork was finally rammed home. The wool absorbed the excess moisture, and later the flies were transferred in perfect condition to the killing bottle. By this means I caught several interesting species of the Tipulids.

Among them were males and females of *Geranomyia caloptera* Mikan, which has its wings delicately dappled with small black spots. The genus is remarkable among the Tipulidae for its abnormally long stiff straight proboscis. I also took a series of both sexes of *Limonia tripunctata* Fabricius, another species with black-spotted wings, and females of *Orimarga virgo* Zetterstedt and *Dicranomyia signata* Jackschewitz. Besides the Tipulids, I took from the moss-covered rock a male of an apparently new species of the Stratiomyiid genus *Oxycera*.

Making my way back to the shore, I walked on and soon found myself in a wilderness of rocks above which towered a beetling cliff several hundred feet high. Suddenly, I heard shouting from the top of the cliff. Looking up, I saw two men standing by the edge. I was fascinated by the wonderful echoes produced by their shouts, which after a moment or so reverberated back from the far distance. Then I saw the men frantically waving their arms in my direction, and realised that they were not amusing themselves by raising the echoes, but were warning me of something. I scrambled up over some loose shale into a small cave. As I reached it a section of the cliff-face went up in a devastating roar, and lumps of rocks came hurtling in all directions. Unknown to me, blasting was going on in the vicinity! Unfortunately, I was ignorant of the Yugoslav equivalents of danger, beware, run for your life, and such like. When all was quiet again, with some trepidation I made my way down to the shore and started to walk back to the hotel.

When I got there, soaked and chilled, the rain was still coming down in bucketfuls. So I spread out my clothes to dry in my little room and went to bed to get warm again before preparing my day's captures.

The next morning was cold and cloudy, but dry. After breakfast, I went down to the nearest lake and swept the sheltered branches of some willow trees overhanging the water. This produced a fairly satisfactory assortment of flies, including several interesting species of the aquatic breeding Empid genus *Hemerodromia*. By midday it was raining heavily again, and this continued until well into the afternoon. I then went into the forest to try my luck. Despite the soaked foliage there were plenty of Tipulidae on the wing, mainly of the subfamily Limoniinae. I took seven species of the genus *Dicranomyia*, including the male of a species new to science, which Nielsen of Denmark has done me the honour of naming after me. The other *Dicranomyia* were *dumetorum* Meigen, *decem-maculata* Loew, *ornata* Meigen, *inusta* Meigen, *signata* Lackschewitz and ? *strobli* Pagast. I also took the male of a large *Limonia* with strikingly brown patterned wings, another species which Nielsen has found to be new to science. It has been arranged for the descriptions of these two new species to be published in the *Bulletin du Museum d'Histoire Naturelle du pays Serbe*. Other *Limonia* netted on this occasion were *dilutior* Edwards, *tripunctata* Fabricius, *flavipes* Fabricius and *nubeculosa* Meigen.

In spite of the inclement weather continuing throughout my stay at Plitvice, the restricted collecting that I was able to carry out produced quite a satisfactory lot of specimens. It was tantalising, however, to think of the species that I must have missed through the lack of sunshine. On particularly wet days I often resorted to collecting Drosophilidae from fungi growing on the underside of the trunks of fallen trees, the breeding habitat that had produced such an excellent number of species on the day I arrived.

One morning as I went into the forest, a group of men were standing by a large outcrop of rock. I said 'dobro jutro' (good morning) as I passed. When I was well in among the trees and had started collecting, the peace was suddenly shattered by a resounding series of explosions. Thoroughly frightened, I ran as fast as I could in a fruitless effort to find shelter. Rotten trees cracked and fell around me, while small pieces of rock whizzed and whistled through the air with a sound horribly reminiscent of shrapnel during an air raid. I crouched down, holding my haversack over my head for protection. After a while all was quiet again, and feeling very shaky I resumed collecting, alert for any repetition of the alarming occurrence. When I went by the rock outcrop on the way back to my billet, the men were trundling away the dynamited lumps in barrows. To an uninformed foreigner this happy-go-lucky manner of blasting is decidedly nerve-racking.

Although I had become reconciled to the poor selection of food at the restaurant I was dismayed when one day eggs and butter, two of my basic items of diet, vanished from the menu. At the same time, cigarettes became unobtainable. On asking the reason, I was told that higher prices for these commodities were coming into force in a few days' time, and meanwhile the sale of existing stocks was forbidden by a government decree. I could not help wondering whether this was indeed so or if the manager of the restaurant was himself responsible

for the arrangement. The English-speaking lady from Dalmatia who had helped me secure accommodation was non-committal on the matter. When I asked her why the Yugoslavs put up so cheerfully with the shortcomings of many of the hotels she gave me three good reasons. Firstly, they have only in the last few years emerged from the really hard post-war conditions of living. Secondly, most of them have never stayed at a decent hotel. And, lastly, they pay only a half or less of the charge made to the foreigner. She also said that hotel employees are so poorly paid that they do not work hard and the state does not dare put pressure on them. Another reason for the slovenly running of many hotels, she told me, is that the manager himself is quite ignorant of his job, having been given the position because he was a good partisan and is a government supporter.

During my stay in Yugoslavia I took a large number of black and white snapshots, but had saved my single roll of colour film in order to have a visual record of the exquisite hues of the Plitvice Lakes, of which I had earlier read such glowing accounts. But, alas, day after day, the appalling weather made me put off using the film. The time came for me to leave for Zagreb, and still out of grey skies a steady drizzle was falling. After breakfast I loaded my camera with the precious film and wandered along the shores. The lovely blue and green waters were faithfully reflected in the view-finder, but the resulting photographs were complete failures, I hardly need add.

In the afternoon I left by bus on the final stage of my journey. Soon after we had left the lakes behind, we came to an abrupt halt. Workmen were engaged in repairing the road, and the wooden blocks in front of us had been removed for the whole width of the highway. After a heated exchange between our driver and the foreman-in-charge sufficient of the blocks were laid down loosely to enable the bus to crawl over the cavity. After this incident, which delayed us about half an hour, we continued on our way for a few miles. Suddenly a man in a back seat was violently sick over the floor, and we stopped again. All the passengers got out while the driver flooded the floor with water and swept it clean. On we went again. More excitement came when screams like a child in agony came from a bag placed under a seat by a peasant woman who had just got on the bus. She opened the wide neck of the bag and out popped the heads of several forlorn hens, tied by their feet to a ring inside. It was a matter for wonder that they did not die of fright as the vehicle swayed and bumped over the rough roads, but they were still loudly complaining when we reached our destination.

As evening fell, the countryside through which we were passing became flat and uninteresting, and soon the twinkling lights of Zagreb became visible in the distance. Among the passengers a woman in Croatian costume attracted my attention. I was curious to know the significance of several stripes which decorated one of her sleeves, and learnt later that these indicated the number of offspring with which she had been blessed. I was also told that when a widow wishes to marry again she wears on her dress a special vari-coloured pattern of embroidery.

Soon we were in the heart of Zagreb. We pulled up at the terminus near the Trg Republike square, and the bus emptied. I made my way

by tram to the Hotel Esplanade where I booked a small room for my last two nights in Yugoslavia. In the morning I set off for the suburb of Salata to say good-bye to Dr. Lorkovic and my other friends at the Medicinski Fakultet. The doctor came back to my hotel for lunch, and we spent the afternoon in looking over my collection, which had reached the final figure of over nine thousand specimens. It was gratifying to find that the material had not suffered damage from the rough travelling that I had often experienced.

Early the next day I joined the Tauern Express at Zagreb Station to start my journey home. My memories of Yugoslavia are of a fascinating country and a proud and kindly people. Perhaps this account of my travels will be helpful to other entomologists who may think of visiting the Federated People's Republic, especially those who wish to collect in the lesser known places outside the tourist areas. Collecting in Yugoslavia is not without its difficulties. There are so many inhospitable rocky regions, communications between one good collecting locality and another are often bad, and even humble accommodation is frequently hard to find. But in suitable situations a large and interesting insect fauna occurs, and as a dipterist I feel that I have only touched the fringe of my particular Order of insects. I hope to return.

(Concluded)

54 Crossways, Addington, Surrey.

Current Notes

The Eleventh Congress of British Entomologists, organized by the Society for British Entomology will be held in Oxford on July 3rd-6th, 1959. All persons interested in any aspect of British Entomology are invited to attend this congress, and to be accompanied by wife or husband. Accommodation for both ladies and gentlemen will be at Jesus College.

On Sunday, July 5th, there will be a collecting excursion to the Chiltern Hills, and on Monday, 6th, in the afternoon, there will be a visit to Wytham Wood, near Oxford, where much of the ecological work of the Hope Department is carried out. On Saturday, July 4th, after tea, there will be an exhibition meeting, at which exhibits brought by visitors and selected parts of the collections of the Hope Department of Entomology will be on view.

On the day of arrival, Friday, July 3rd, there will be, after tea, the opportunity to join a guided tour of two of the Oxford colleges, and after dinner, a film show by Dr. H. D. B. Kettlewell entitled "Evolution fast and slow". The official congress reception and dinner, at which lounge dress will be worn, will be on Saturday, July 4th.

The cost of full participation in the congress, excluding travel to and from Oxford, will be about £6. A copy of the programme, when ready, and other information may be obtained from the organizing secretary, Dr. M. W. R. de V. Graham, Hope Department of Entomology, University Museum, Oxford. It is hoped that the congress will provide good opportunities for renewing old friendships, for those to meet who have special interests in common but have not previously met, and for younger workers to meet those with an established reputation in their particular field.

ENTOMOLOGICAL LIAISON WITH THE NATURE CONSERVANCY.—We have been asked to bring to the notice of all entomologists the formation of this committee early in 1958 within the Royal Entomological Society of London, for the purpose of advising the Conservancy on entomological matters.

There had been many complaints that the Conservancy thought of nothing but wildfowl and mammals, but it is pointed out that many reserves have been established because of entomological interest. The Conservancy is anxious to arrange in due course for entomological surveys with a strong ecological content of all nature reserves and of the Sites of special scientific interest notified to local planning authorities. In this work both local societies and individuals can assist.

The secretary, Mr. Paul Freeman, will be pleased to receive suggestions for research opportunities and of problems needing study, addressed to him c/o The Nature Conservancy.

We are glad to note that entomological interests are being watched, and we have no doubt that those with something of public interest to communicate will co-operate with the committee, but there are those who would have liked to have heard more of the conception, incubation and birth of this committee instead of being advised of it as a *fait accompli*.

S. N. A. J.

A further Part of *Die Schmetterlinge Mitteleuropas* by Drs. Forster and Wohlfahrt (Stuttgart-O. W. Keller & Co.) has just been issued. The text of this latest *opus* on the European Lepidoptera gives a brief description of life history, habitat, main varieties, and very broad distribution, e.g. common in Middle Europe. A considerable amount of information is crammed under most species and the plates are quite good. Incidentally, now that Heslop has added *Uelerio hippophaes* to his list, other optimists may be interested to read that the larvae may be found sunning themselves fully exposed on top branches of Sea Buckthorn!

R. G. C.

The Danish *Flora og Fauna*, 64, 113 (1958) notes *Alispa angustella* Hb. as an addition to the Danish list, a specimen having been taken at m.v. light in Seeland. There is also a note on *Maniola jurtina* L.

As usual, *Zeits. der Osterreichischen Entomologischen Gesellschaft* has much material interesting to lepidopterists. Dr. J. Klimesch lists microlepidoptera of the Wachau, Lower Austria, and Dr. Amsel writes on the microlepidoptera of Cyprus, describing three new species. Dr. Franz Burgermeister writes on a light trap in the Villach district, and S. Toll describes three new *Acrolepia* species and one *Roesslerstammia*. Hans Reisser writes on new moths from Crete, describing eight new species with half-tone plates of genitalia and type specimens, and Ch. Boursin describes *Euxoa psimithiosa* from Spain as a new species. Hugo Reisz writes on the genus *Zygacna* and Karl Burmann writes more on the Tyrolean lepidoptera. The "Festnummer" contains much of interest, and there is a useful list of the works of authors who have published papers of interest in the Society's publications since 1954.

S. N. A. J.

Notes and Observations

DORSET LEPIDOPTERA IN FEBRUARY.—It has been very mild at Upwey during the latter part of February and some species have appeared exceptionally early. *Aglais urticae* L. was seen on most days during the last week of the month; *Vanessa atalanta* L. on the 27th and *Gonepteryx rhamni* L. on the same day. At m.v. light on the 23rd I took one *Lithophane socia* Hufn., 4 *Phigalia pedaria* Fab. and one ♀ *Biston strataria* Hufn. (no ♂♂ seen up to date). On the 25th one *Orthosia gothica* L. appeared, with one *O. stabilis* Schf. and 5 *P. pedaria*. On the 27th I flushed an *Erannis marginaria* Fab. from some ivy and found a plume moth in a water tank.—Brigadier H. C. WARRY, Eastbrook, Upwey, Dorset. 1.iii.59.

EARLY LEPIDOPTERA IN ESSEX.—I saw my first *Aglais urticae* L. flying on 24th February. The last few nights my trap has been producing *Phigalia pedaria* Fab., *Alsophila aescularia* Schf. and *Theria rupicaprararia* Schf.—A. J. DEWICK, Curry, Bradwell-on-Sea. 23.ii.59 (*in lit.*).

EARLY LEPIDOPTERA IN HERTFORDSHIRE.—Spring has arrived before its official date. On 12th March and again on the 13th I saw *Pieris rapae* L. flying in my garden. I looked up my diaries and the earliest previously recorded date therein for this species was 21st March. *Gonepteryx rhamni* L., *Aglais urticae* L. and *Nymphalis io* L. have been flying in some numbers on the fine days in the latter half of February. I have used the m.v. trap on three occasions and the only insect of note was *Cerastis rubricosa* Schiff.—CLIFFORD CRAUFURD, Denny, Galloway Road, Bishop's Stortford. 14.iii.59.

HABITS OF APATELE ALNI LINN.: A TREE-TOP DWELLER.—Mr. Fairclough's note in the February number reminded me of an incident of many years ago which goes a long way to confirm his suggestion that *A. alni* is a tree-top dweller.

When Dr. Bernard Kettlewell and I were schoolboys, we used to stay together and collect in the New Forest. Even in those days Kettlewell's energy was considerable, his field work skilled and there was the light of combat in his eye and fools were not suffered gladly. One night we went down to sugar in the old sugaring ride of Hurst Hill Enclosure but found an elderly and no doubt distinguished entomologist in possession. "And what have you boys been catching?" he asked. "Well we have been finding a lot of *alni* larvae", we replied. "Nonsense my boys", he said, "I have been collecting in the New Forest since before you were born and I have never found one yet; you must have got the identity wrong". We said nothing. Next morning we arrived at his digs carrying a large biscuit tin, were duly admitted, placed the tin on his table and whipped off the lid to expose many magnificent *alni* larvae (far too many, they mostly died!) in their last instar, curled up like question marks on leaves of birch. Collapse of elderly party!

How had we got them? Along the sides of the rides in the then unkept condition of the Forest there grew many tall but spindly birches.

With some effort these could be bent over like a fishing rod so that the top leaves were exposed to view. On these topmost branches, in full sun on the upper surface of the leaf sat the *alni* larvae in their characteristic attitude. Only the trees on the sunny side of the ride were much good.

I told this story to Dr. Cockayne and it may have been this information that he referred to when he made the remarks quoted by P. B. M. A.—R. P. DEMUTH, Watercombe House, Oakridge, near Stroud, Glos. 20.ii.59.

LARVAL BEHAVIOUR.—Mr. Symes's note on the behaviour of a larva in last December's *Record* (*Ent. Rec.*, 70: 307) reminds me of an incident that occurred on my lawn last summer; but my larva did not aspire to such great heights as his did. One night as I watched the sheet under my m.v. lamp I noticed something moving on the grass some five or six yards away, and about ten yards from the edge of the lawn. On closer examination I saw that it was a full-grown larva of *Deilephila elpenor* L. travelling straight towards the light. It duly arrived on the sheet and appeared to be rather angry that it was unable to burrow its way through. Unfortunately my observation then ceased as I was tempted to box it for a friend. I should be interested to hear whether any other readers have ever had a similar experience. The m.v. certainly makes collecting far too easy.—Brigadier H. C. WARRY, Eastbrook, Upwey, Dorset. 1.iii.59.

EARLY MENTIONS OF THE ANGLE SHADES MOTH.—In his Book Notes last month (*Ent. Rec.*, 71: 86) Mr. Allan asks for early references to the English name of *Phlogophora meticulosa* Linn. It is certainly remarkable that the Oxford University Press has no knowledge of "angle shade moth" earlier than 1949 (surely Cambridge would have done better). Mr. Allan quotes the use by Moses Harris of the name "angled Shades" in 1775 and the same author in his famous book *The Aurelian*, dated 1766 on the title-page but published in parts from 1758, uses this form of the name in the index, though in the text accompanying Plate xli he calls the moth "Angle Shades". I regret I cannot push the date farther back than this. Petiver is not on my shelves, nor is Wilkes, *One Hundred and Twenty Copper-plates of English Moths and Butterflies*, and the latter's curious and rare *Twelve New Designs of English Butterflies*, 1742, which consists of twelve plates of butterflies and moths arranged in symmetrical patterns, does not include *P. meticulosa*. Albin, *A Natural History of English Insects*, 1720, devotes his plate xxx to this moth, but gives it no name; he says the caterpillars "Were taken on the Bramble the 26th of June near Newington-green, they went into the Ground the 10th of July, spinning the Earth about them with their Web, and chang'd to Chrysalies (sic); and on the 6th of August came forth a beautiful scallop'd winged Moth elegantly marked . . . I had one of these Moths which did not come forth 'till the 26th of November. See Lister on Goddard, page 54, No. 44". This reference is to a Dutch entomologist, Johann Goedaert, and the English translation of his work by Martin Lister, published at York in 1682. Fig. 44 is a barely recognizable *P. meticulosa* with a larva which might be anything, again unnamed: "The Catterpillar of the 44th Table, feeds on Dogs-mercury, as soon as it perceives anything it is not u'st to, it casts it selfe upon

the ground, and lyes round in a *Ball*, as though it was Dead.—It changed the 30th of *July*, and the 26th of *August*, came forth a *Butterfly* . . . of a rare shape and colour; the fore part of its Body was Hooded as it were, it lived long without Food, and was very fearfull". Mr. Allan also refers to Mouffet; I cannot find this insect illustrated in the first (Latin) edition of 1634, nor in the English translation added to the second (1658) edition of Edward Topsell, *The History of Four-footed Beasts and Serpents*, which has the same woodcuts. And in any event *vinula* and *porcellus* are almost the only names mentioned in this work.—J. O. T. HOWARD, 11 Grafton Street, London, W.1.

EREBIA AETHIOPS ESP. IN WORCESTERSHIRE.—When examining the collection of Mr. A. E. Ward, a Birmingham resident, I noticed that the series of *Maniola jurtina* L. included a male *Erebia aethiops* Esp. taken in August in Wyre Forest. Mr Ward told me he had netted it with the eight *M. jurtina* at the same time, set them all on one board, and had not realised the presence of the stranger. We made a visit to Wyre, and he showed me the exact spot where he had taken the insect. Presumably the explanation is that a pupa was brought from Scotland in some material for agriculture or garden, by train or lorry; but the extraordinary coincidence is that the insect appeared in an area which is not unlike its native habitat, rather than, say, in the middle of Birmingham. Mr. Ward has not been abroad and has never exchanged nor bought specimens, and his collection is all of his own capture.—Colonel W. BOWATER, 41 Calthorpe Road, Edgbaston, Birmingham, 15. 18.ii.59.

LAPHYGMA EXIGUA HUBN. IN WARWICKSHIRE.—To the many records of *L. exigua* which have appeared of late years you might care to add that a specimen was in my m.v. lamp-trap in my garden here at Edgbaston on 18th August 1958. I know of no other record for Warwickshire except that of L. J. Evans, who caught one in his trap here and exhibited it at the 'South London' exhibition in 1957.—Colonel W. BOWATER, 41 Calthorpe Road, Edgbaston, Birmingham, 15. 17.ii.59.

MACROGLOSSUM STELLATARUM L. AND EUPITHECIA VALERIANATA HÜB.—I was particularly interested in the two letters in last month's number (a) concerning a habit of *Macroglossum stellatarum* L., and (b) *Eupithecia valerianata* Hb. in Kent.

With regard to the first topic, I think I have solved the problem. Having often watched this hawkmoth flying in the early evening *after* a sunny day, up the walls, and along the slopes of roofs, in an apparently quite aimless fashion, I have come to the conclusion that it is merely revelling in the hot air radiated from the bricks and tiles, and then it flies as close to them as possible. This would explain why, to quote: "on grey days or when the walls are wet, the moths seem to have no interest in them".

To substantiate this suggestion, I believe that some moths, in a rather similar way, sit on, or fly low along tarred roads at night after a sunny day. This explains how often, when driving at night, moths are shown up by the beams of headlights, but are not seen arriving—they have been sitting on the road and rise vertically on being disturbed—how about trapping with radiant heat and light!

Turning now to *E. valerianata*, I took this insect several times at light at Portland, although, as far as I can ascertain, its natural food-plant is entirely absent from the island—which, however, is smothered in parts, chiefly in the old quarries, by the cultivated valerian so often found in gardens.

With regard to local news, so far very few moths have been observed at light, in fact about three *Anisopteryx aescularia* and 8/10 *Phigalia pedaria*, represent the total over recent nights—but of the *pedaria* one was—shall I say, semi-melanic?—hardly any markings, and looking transparent, and one a beautiful fully melanic specimen. In 25 years' collecting in many parts of the country, I have never seen one before, and never expected to, so far south.

South does not note the black aberration *monacharia* south of Yorkshire. This was an appreciated capture, but raises the question, in this science and industrial ridden age, are all our moths gradually going black? Horrid thought! Imagine, for example, the appearance of a choice drawer full of "pugs" all black! What melanic pugs there are are bad enough—I just cannot tell what they are, even non-melanic specimens are hard enough to differentiate.—G. A. FORD, Balsham Rectory, Cambs. 4.iii.59.

A HABIT OF MACROGLOSSUM STELLATARUM L.—I have read with great interest the two observations which appeared in the *Ent. Rec.*, 70: 203 and 71: 54-55. This very quick-flying hawk-moth has also drawn my attention, and I have also wondered what its interest in sun-baked arid rock could have been! Year in and year out, during the same time of the year, I have noticed its queer behaviour, as one would think at first thought. I think I have come to a conclusion, quite recently, when I decided to have a good and thorough investigation. With us in Malta, this moth is a common sight in well sheltered valleys, during the months of January-March, especially on bright sunny days; and although wild flowers are in bloom and other insects frequent them, this moth prefers sipping, with its long tongue, the honey that is left in the old nests of a common bee, *Megachile (Chalicodoma) sicula* Rossi, to the nectar of the flowers. This wild bee makes its nest in small holes or cavities which it then blocks with plaster of sandy soil, after laying the egg and storing the food for the larva. When the new bees are out, the nests remain open and, I think, the attraction to the rocks is actually to the discovery of old nests and what is left in them.—ANTHONY VALLETTA, F.R.E.S., 257 Msida Street, B'Kara, Malta G.C. 21.ii.59.

LARVAL COLORATION OF DEILEPHILA NERII L.—What Mr. Leech writes in the last paragraph of his *Letter from Ghana* (1959, *Entomologist's Record*, 71: 32) is, I think, incorrect. The pink/brown form of larva figured by South on Plate 1, Vol. 1, is the colour assumed by the larva after it has finished feeding and is seeking a pupation site. I drew attention to this some years back (1947, *Entomologist*, 80: 218). Actually, the figure is not bright enough, the dorsum should be almost black, steel-blue and the lateral area a livid orange-pink.

The brown form of larva, which is fairly common in East Africa but which I never found in India, is quite different with the dorsal area a pale brownish/yellow and with a darker brown lateral stripe on the abdominal somites with its upper edge dentate. In other words, the

pupating larva has the dorsum dark and the sides pale whilst the brown form has the sides darker than the dorsum.

In India I produced a form of larva in which the normal green colour was replaced by ochreous. This form only appeared in overcrowded cultures and appears to have been due to the loss of the blue component of the pigment as the indigo edging to the ocellus was changed to a reddish purple.—D. G. SEVASTOPULO, F.R.E.S., P.O. Box 881, Mombasa. 14.ii.59.

LIMOSINA RACOVITZAI BEZZI (DIPT.) IN CUMBERLAND.—In working moles' nests for beetles at Greystoke, Cumberland, in late November 1958, I took two dipterous flies which I sent to Mr. Fonseca. He identified them as *Limosina racovitzai* Bezzi, ♀♀, var. *macrops* Duda. This is a species new to Cumberland and I gather that information of its general distribution in this country is scanty.—W. F. DAVIDSON, 9 Castlegate, Penrith. 1.i.1959.

ADDENDUM.—The following species are to be added to the list of Coleoptera in the paper by Mr. W. F. Davidson on page 85 of the March issue:—*Pterostichus nigra* Schal., *Psephenus heisei* Herb. and *Rhinoncus castor* Fab.

It is with deep regret that we have to announce the death of Dr. G. V. BULL, M.B.Cantab., of Sandhurst, Kent, who died on 2nd March in his 87th year.

As we go to Press we also learn, with deep regret, of the death on 16th March, at the age of 88, of Mr. P. A. H. MUSCHAMP, friend and companion of J. W. Tutt on many of our founder's entomological visits to Switzerland.

The Macrolepidoptera of Inverness-shire : Newtonmore District

By Commander G. W. HARPER, R.N. (Retd.), F.R.E.S.

(See *Ent. Rec.*, **66**: 58, 90, 124; **67**: 39; **68**, 91; and **69**, 52)

SUPPLEMENT NO. 4

It is a great pleasure to record five more species new to my main list for the Badenoch district, as defined in that list. All are fairly common Southern species; three of them may well have been overlooked in the past, all are probably on the edge of their range which it is to be devoutly hoped is gradually extending.

The additions are as follows:—

THYATIRIDAE

Habrosyne pyritoides Hufn. (*derasa* L.). A male of this beautiful species was taken at m.v. light at Aviemore on 30th July 1958 by Mr. R. Fairclough. I do not know of any recent Scottish record, and only one old one for Clydesdale.

AGROTIDAE

AMPHYPIRINAE

Caradrina blanda Schf. (*taraxaci* Hb.). A male of this inconspicuous species came to Mr. P. Le Masurier's m.v. light trap at Aviemore on 20th July 1958, and another to my own at Newtonmore on 27th July. The moth is not uncommon and widely spread on the lower ground surrounding the central Highlands, and I think it is probably now penetrating them.

Nonagria typhae Thun. A male in fair condition, but with the abdomen remarkably deficient in grease, came to my m.v. trap at Newtonmore on 14th September 1958. No species of *Typha* grow locally but a few small clumps of *Sparganium erectum* might conceivably support a small colony of the moth, but I think it more likely to have been a vagrant. The moth has been recorded recently from Forres by Mr. Savage.

GEOMETRIDAE

STERRHINAE

Sterrha inornata Haw. Mr. R. Fairclough reported a specimen of this "Wave" at m.v. on 30th July 1958, and Mr. P. Le Masurier had a worn male in his m.v. trap on 15th August, both at Aviemore. Determination of the latter insect was very kindly confirmed by Mr. D. S. Fletcher of the British Museum (Nat. Hist.). This is another inconspicuous species which is not rare in several localities surrounding the Central Highlands, and may be increasing its range.

LARENTIINAE

Earophila badiata Schf. No less than three specimens of this common English species were recorded for the first time in this district in 1958 by Mr. P. Le Masurier on 8th May, and by Mr. J. O. T. Howard on 16th May, at m.v. light. *Rosa canina* the Dog Rose is very common all over the area, and *Anticlea derivata* Schf., a close relative of *E. badiata* is abundant, so that I have always been surprised at the apparent absence of the latter. It is probably also increasing its range from lower levels.

This supplement increases the total number of Badenoch Macrolepidoptera at the present date, January 1959, to 357 species.

Neadaich, Newtonmore, Inverness-shire, 14.1.1959.





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AND JOURNAL OF VARIATION

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At Random

By G. C. HOLROYD

Part of my boyhood was spent in an old house, in what was then a semi-rural district. There was a fairly large garden containing some tall yew and holly hedges, and we had a number of rather dilapidated outbuildings. The whole place harboured numerous moths, although most of these were naturally of the more common kinds, and it was there that I developed my first real interest in entomology. I recall that *Mania maura* and *Naenia typica* sheltered in numbers in the dark outbuildings, and *Catacola nupta* used to rest outside, a favourite place being rather high up, from where *nupta* could only be taken by first climbing up a sloping out-house roof. *Plusia chrysitis* and *Ourapteryx sambucaria* were more in evidence than I have seen then since, and there I took my first *Plusia moneta*, which at that time had not been on the British list for a great number of years.

I do not know how much of the old garden remains, but the surrounding fields are now all built over, and there seems little doubt that the butterfly and moth population of that area has been sadly reduced, as is happening in so many places.

Luckily not all of one's recollections are of localities despoiled, and there are woods where I have seen *Argynnis paphia* and *Limenitis camilla* swarming on the brambles, and watched *Apatura iris* sailing round the tops of oaks and sweet chestnuts, that not long ago were, and I believe still are as untouched as when I first knew them, which was in one or two exceptionally good butterfly years that do not seem to have been equalled since.

It is unusual (except perhaps in the case of open-cast coal fields) to see ground returned to something approaching its original state, but I have recently had that experience with a piece of downland within a few hundred yards of my own garden, where there was a prisoner of war camp that has now been demolished. There is no reason to believe that this ground is to be 'developed', and perhaps before long it may support more *Lysandra coridon*, *Cupido minimus*, and other butterflies that are already found nearby.

My own collecting has always been just part of a wider interest in the countryside, and memories of some enjoyable times with the net are usually varied by other things, such as the pair of foxes I watched in the Sussex field at the close of a day after *iris*; the tiny adder basking on the North Downs, which I could have safely trodden upon and killed, and from some points of view ought to have done, but instead choose to let it go free; and the glimpse of a deer while *coridon* hunting near the same spot.

A different kind of incident occurred late one night while looking round the lamps on the local by-pass, for moths. These frequently settled in the lighted areas, and could be boxed without a net. A couple of policemen in a car had noticed me 'hanging about' for some time, and quite rightly stopped to investigate. By producing a few of my pill boxes, and also my identity card, there was little difficulty in convincing them that I had no nefarious intentions!

One or two of my collecting friends are now, perhaps, hunting in the Elysian fields, and the net does not do so much work as it used

to. But if captures are fewer, the pleasures of observing are certainly no less than in the days when one was able to keep going from dawn till dusk, and to take things like *paphia* and *camilla* provided a thrill.

A Forgotten Discard: The Problem of Redundancy

By A. E. COLLIER

Driving slowly along a Surrey lane on 30th June 1955 the warm air and the fragrant scent of privet for a moment sent my thoughts nostalgically to Northamptonshire woods and *Strymonida pruni*.

I arrived at my destination, a very secluded and secret little clearing, where I intended to look for the last of the *selene* and *aurinia*, and possibly to put up an early *Aphantopus hyperantus*. As I emerged from the forest into the clearing a small black butterfly flew up, and I followed it to a blackthorn tree where it settled. To my amazement and delight I found it to be a male *pruni*, and a further search revealed several others on bramble or buckthorn flowers.

I then remembered that in 1952 I had released a few unwanted *pruni* which I had brought with me from Oundle in the egg stage in 1951. These had been released in another small clearing surrounded by dense blackthorn thickets, and a few hundred yards through the forest from my present locality. A search in the original clearing revealed a few more results of my 1952 discards.

In subsequent years I have visited the spot regularly about the end of June and have invariably seen a few—in 1956 as many as thirteen—*pruni* resting on the blackthorn, or visiting the flowers of bramble or buckthorn.

I hope to put down some privet this year to make conditions even more homelike, and I trust that I shall be forgiven by the purists for unthinkingly establishing a butterfly not generally considered to belong to the Surrey list.

This question of disposing of redundant butterflies, when breeding large numbers, often presents problems. There is a legend to the effect that the appearance of *syngrapha* in a colony of *coridon* ultimately leads to the disappearance of the colony. I can hardly believe this is possible, but I know that one collector at least objects to me releasing males, heterozygous for *syngrapha*, on a well-known down, although the possibility of a rash of blue females on that down in 1960 is rather intriguing.

The fact remains that in 1959 I may have to release a great number of such males, and it would be a pity to let them all loose in suburban gardens or oak forests to the consternation of other collectors, and to their own frustration.

For five years I have been breeding *A. hyperantus* ab. *lanceolata*, and these I have no compunction about releasing in any suitable locality. It is a yearly pleasure to see the character persisting where I imagine no collector would object to finding them.

Apatura iris can be tiresome, as they emerge at intervals over a long period, and must be released in the depths of the woods, well away from the acquisitive eyes of collectors passing through the dis-

trict in their care. This when the demands on one's time from the *Satyridae* and *Lycaenidae* are particularly heavy. I believe, however, that annual breeding and release does help to keep *iris* going in its many widely distributed localities.

Euphydryas aurinia are a simple matter, as their disposal coincides with a natural desire to inspect their colonies, along with the *euphrosyne* and *selene*, which frequently fly with them.

A difficult problem arose, however, when I was breeding the aberrations *aperta* and *mosleyi* of *Melanargia galatea*. The heterozygous form *aperta* was a dominant, and I had no desire to spread these beautiful and very rare forms all over Surrey. The only solution was to destroy them, and I was relieved when ants put an end to my activities by helping themselves to all the eggs in 1954. Incidentally, I have never been able to understand why *galatea* does not appear to exist in Surrey, as there are many admirable localities similar to those around Oundle in Northamptonshire, where well populated colonies were very plentiful.

I hope that nobody's feelings will be hurt if I introduce them again into parts of the North Downs.

The commoner butterflies such as *jurtina*, *aegeria*, *urticae* and *io* are perfectly happy in a reasonably sized garden, and in these cases there is no doubt at all about approval from the local family of fly-catchers.

I also regularly release numbers of *Thecla betulae*, bred from eggs taken in early spring. These are widely distributed around Cranleigh, but never in great numbers. Their imagines are frequently seen in local gardens in September, and I continue to hope that they will settle down in an oak and blackthorn thicket at the end of my own garden.

Further Vapourings

BY A YOUNG MOTIL-HUNTER

Bearing in mind the saying "sufficient unto the day is the evil thereof", and an Old Moth-Hunter's recent article on mercury vapour, it is all the more strange that only a week or two ago I was talking to an acquaintance on the same subject. His remarks, too, were illuminating.

"I don't do much collecting nowadays", he said. "Not nearly as much as I used to. In fact, I've almost given it up. What with the kids and the garden, to say nothing of the house, for as you know we've no help these days, my photography and the confounded television, there just isn't time. And anyway, I'm too tired in the evenings after slogging away at the office all day".

"The answer to your problem is mere . . ."

"Don't talk to me about mercury vapour light! It's an innovation of the Devil, and I'm not falling for it at any price!"

"What have you got against it?"

"Well, basically, it's so slovenly. You switch on, wait a bit, then shuffle outside in bedroom slippers, kill what you happen to want out of what happens to have arrived, and shuffle back indoors again. You are none the wiser, and have learnt nothing. It's far too easy".

"On the contrary, quite a lot has been learnt. Look at some of the recent astonishing local lists, for instance".

"Local lists are an appalling craze. The product of unfortunate individuals who can produce nothing but local lists!"

"Personally I'm heartily sick of this idea that you've got to be learning something all the time. Enjoying nothing for the sake of it can apparently be indulged in only by absolute outsiders. I've been collecting with you often enough to know that you enjoy 'the chase' as much as anyone. Why criticise those who are content to leave it at that?"

"I'm not criticising. I'm only saying they could, or should, get more out of collecting".

"Conceit! Who's to decide how much or how little anyone else should get out of his leisure time? You'll be telling me next what an enormous amount you gain from your television set!"

"Well, as a matter of fact, I'm sure I do. It's not all rubbish, you know. I believe I gain a lot more from my television set than you can possibly do with your hideous, indolent, mercury vapour lamp. It's degenerate and unprogressive".

"Ah! I wondered when you'd say 'progress'. You all say it—and I challenge you to define it! Surely you would call it progress to have got *alni*?"

"Not with a mercury vapour lamp I wouldn't!"

"But wouldn't you like to fill the gap?"

"Yes, of course I would, but not that way".

"But why not?"

"Well, it seems so worthless. What would I know of the life history, habits, method of pupation, whether the larva hibernates or not? You have got a complete series of *alni*, haven't you? Can you tell me what the egg looks like? Does the young larva eat the edge or the middle of the leaf?"

"I must confess I haven't the foggiest idea".

"There you are! Proof! Mercury vapour is utterly, utterly, bad. You said that as if you don't really care what the answers are!"

"Oh, come, I think you're being a bit hard. As a matter of fact I do care. Did I really sound like that? To show that I'm sorry, next time I get a female I shall try to get her to lay".

"Now that's the first sensible thing you've said this evening! I tell you what we'll do. If you succeed, we'll share the eggs. If yours perish, mine may survive, and vice versa. It could be really worthwhile".

"You would be prepared, then, to fill the gaps in this way?"

"I'll think about that when, and if, the times comes. For the moment I shall be quite content with a few caterpillars. By the way, I'd quite like to be there when *alni* comes to your horrible box of tricks".

"You know you're welcome. Come any night between dusk and dawn. Bring a camp bed! Seriously, though, I'm glad about this. I think a good entomologist is going to be saved . . ."

"From the TV?"

"I was going to say *by* the MV!"

Notes on the Microlepidoptera

By H. C. HUGGINS, F.R.E.S.

Tortrix diversana Hubn. I have had several enquiries in the last few years as to where to get this moth. It is a rather strange and baffling creature. I have taken odd specimens in most parts of Kent but have only once found it commonly. This was in an old orchard at Bobbing near Sittingbourne, which had been planted many years before with a plum, then no longer fashionable, called the prune. I was returning from a walk in early July 1922 and crossed this orchard just at sunset, when an amazing number of moths were flying round and over the trees. They were behaving in the same style as *Cacoecia lecheana* Linn., but the date was a month too late for that insect, so I netted a couple and found that they were *diversana*. As they were much too active to obtain easily I went home and turned out at daybreak the next morning. As I anticipated, the moths were settled in swarms on the lower boughs of the trees and at that hour fell to the grass below at a tap. I remember I knocked down over fifty from the first tree and, after filling my boxes, came home. As I left Sittingbourne the next year I do not know how long the moth continued in the orchard in such numbers; it was just as common in 1923 when I got Sheldon a series but since then I have never been to the place.

The orchard was the freehold property of a farmer, an old friend of mine, who was then over 70, so it has almost certainly changed hands and almost as certainly been stubbed and replanted. I anticipate that modern spraying methods also will have exterminated this and other interesting orchard insects. Indeed, the country will soon be inhabited only by Pest Officers, rats, and farmers.

Cnephasia genitalana Pierce. This is a moth of which I have heard very little of recent years, although it must still be found on the Kentish coast on the chalk from St. Margaret's Bay to Folkestone. There is a group of the genus *Cnephasia*, which is found on the cliffs of this district, particularly on the screes and cliff sides where a little grass grows. The insects in it vary from chalk-white to chalk-white with a pale grey band; they are very beautiful and were lumped by the old collectors as *conspersana* Dougl. (*perterana* Doubld.). For a couple of years I collected all I could of these and sent them to Pierce for examination. His finding was that *conspersana* was very rare in these localities, he only found one amongst about 30 I sent him, and half a dozen *genitalana*, the rest all being a most striking series of aberrations of *chrysanthemana* Dup.

Genitalana is rather smaller than *chrysanthemana* otherwise its habits and food are similar. The larva feeds in the shoots of a variety of plants, spinning the heads together, and is particularly fond of ragwort. When I collected these insects in the Swanage area, however, every one turned out to be *conspersana* and the forms were not nearly so white as in Kent. I have now bred the genus *Cnephasia* from most cliffs from Dorset to Cornwall, and practically all have been *conspersana*, with an occasional typical *chrysanthemana*.

COLEOPTERA

Collecting Longhorn Beetles in 1958

By F. A. HUNTER, M.A., F.R.E.S.

It would be unrealistic to comment on beetle collecting during 1958 without first making some reference to the discouraging weather which was only at infrequent intervals conducive to outdoor collecting. However, an interest in wood boring insects carries with it some measure of independence from the weather in that many species can be found even on rainy days by examination of the wood in which they feed. It could almost be argued that wet weather is advantageous because it is only when sweeping and beating are prevented that the collector is offered the inducement to search in the timber itself, and only when this is done can any experience of the immature stages and biology be obtained.

I was fortunate enough to be at the right places at the right times more frequently this year than before and consequently to have met with several species for the first time. The notes which follow are expanded from my field collecting notes and follow through the season in chronological order. Most of the localities visited are freely open to the public, but I am grateful to Sir William Cornewall, Bt., for his permission to collect in Moccas Deer Park and to the Nature Conservancy for allowing me to visit Roudsea Wood.

I first ventured out on 17th February at Witherslack, Westmorland, where moderate numbers of larvae of *Rhagium mordax* Deg. were found under the bark of a large fallen birch log. The other common British member of this genus *Rhagium bifasciatum* F.—whose adults also overwinter in their pupal cells—was also found, adults being dug out from a rotting hazel branch. A single larva of *Strangalia maculata* Poda was found in the pith channel of a narrow ash twig. These three species are among the commonest of the British longhorns. Next day, a visit to Meathop Moss, near Grange-over-Sands, proved rather more interesting. Most of the dead pines on the moss were infested with moderate numbers of larvae of *Asemum striatum* L. and *Rhagium bifasciatum* and some borings found in the outer sapwood of large fallen dead Pines were probably made by *Tetropium gabrieli* Weise. Both *A. striatum* and *T. gabrieli* have only recently been recorded from this vice county (Birkett, 1958). At Roudsea Wood on 20th February, larvae and adults of *Rhagium mordax* were again found to be common, this time under the bark of oak, alder and birch. It was interesting to find that these larvae were often in company with those of *Pyrochroa coccinea* L. These latter are vicious-looking creatures, although when I kept them in tins together with *R. mordax* larvae they never attacked them; it may be that they feed on the frass of the Cerambycid larvae. (Eight adults of *P. coccinea* were reared from these larvae—it is interesting that this species which is normally regarded as Southern in distribution should occur here (Twinn, 1958)).

On 4th March I visited Freshfield near Southport where there are extensive pine woods. This very well-known locality with its rich arenicolous fauna is not a good area for Cerambycids, but *Arhopalus ferus* Muls. which has now been breeding here for some years is still very common in the dead pines and larvae of *Aromia moschata* L. were found in the living wood of several of the young willow trees which

grow in clumps on the nearby golf course. (An adult of this species was found when the area was re-visited on 30th August).

On 7th April I paid my first visit to Pettypool Wood near Northwich in Cheshire. This is a moderate sized wood—comprising mainly broad-leaved trees but with a few conifers—and considering its position it is relatively well endowed as far as longhorns are concerned. The most exciting capture here was a group of larvae and a single pupa of *Superda scalaris* (L.). This was the first time I had met with this beautiful species. All were found in their pupal cells, the larvae in the outer sapwood of a large dead fallen oak branch, the pupa under the bark of a small narrow dead fallen alder branch. The larvae were brought home and put "tail" first into holes of $\frac{1}{4}$ " diameter drilled at an angle of 45° into a piece of Oak branch. The mouth of each hole was covered with a thin piece of cork held in place by an elastic band. Daily examination of each larva was then simply effected merely by lifting the cork "lid" on its elastic "hinge". The larvae pupated between 18th April and 2nd May, the adults emerging between 19th May and 4th June. In all, six adults were reared, four males and two females. It was interesting to watch the eclosion of the adults, the first tear in the pupal skin—in the centre line at the front of the head—appeared to be effected by intermittent tension due to the repeated opening of the adult's mandibles within. The sequence of changes during pupation and eclosion was much as had already been described by Fraser (1950) but the average duration of the pupal period was nearer to four weeks than to five as this author stated.

Apart from *S. scalaris*, examination of the oak trees at Pettypool Wood revealed larvae and pupae of *Clytus arietis* L. and *Leipopus nebulosus* L. and larval and adult *Rhagium mordax*. In the dead alder stumps in swampy ground near the pool which lies in the centre of the wood, larvae of *Strangalia quadrifasciata* (L.) were very common as were adults and larvae of *Rhagium bifasciatum*. A good series of adults of the *Strangalia* was taken when these stumps were again visited in early July. A large pine stump was found to be infested with larvae of *Arhopalus* sp. and when the locality was re-visited in July, a pupa—from which an adult later emerged—and an adult were taken from this same stump. Both were *Arhopalus rusticus* (L.) which in Cheshire has apparently only previously been recorded from Delamere Forest which lies only a short distance westward from Pettypool Wood. This was the first time I had found non-imported specimens of this species.

On 20th and 21st May I went with two friends to Moccas Deer Park, near Hereford, having been interested in this locality after reading a recent description of it by Mr. A. A. Allen (1955). It is evidently a remnant of original woodland and there are some fine large trees, including oak, beech, chestnut and lime, with a few larches. The number of Cerambycids found here was remarkable, amounting to fourteen species in the two days. The weather for the trip was perfect, being very hot and sunny. Many of the longhorns found were associated with the oaks, where they were dug out from their pupal cells. Adults of *Pyrhidium sanguineum* L. in their pupal cells in the outer sapwood of dead oak branches were common in the deer park itself and Mr. P. Skidmore found an adult almost two miles from the deer park so there is the possibility that this beautiful species—which has been found breeding only in this locality within Britain—may be spreading to other

woods nearby. Larvae, pupae and adults of *Phymatodes testaceus* L. were common under the bark of dead oaks as were all stages of *Leiopus nebulosus*. Comparison of specimens of this latter species with others taken in Cheshire shows the northern ones to be appreciably darker in general colour and I have found this difference between Southern and Northern specimens to hold good throughout the series in my collection. In the smaller dead branches of oaks, chestnuts and beeches many circular exit holes of *Mesosa nebulosa* L. were found, although no adults were encountered. Eight larvae of this species were taken from their galleries deep in the sapwood of dead oak branches and six of these had successfully reached the adult stage by mid-August 1958. At the time of writing, the other two are still feeding. A larva and several pupae and adults of *Stenostola ferrea* Schrank were found in their pupal cells in the recently dead wood of lime twigs—still attached to the trees—and old galleries of this species were frequently met with. These were not confined to the very narrow twigs, many borings being found in branches of almost 6" diameter. Both *Clytus arietis* and *Anaglyptus mysticus* L. were common in oak, although adults of the latter species were also dug out of beech, field maple and hawthorn. *A. mysticus* is remarkable in that it attacks very hard dry dead wood. Among the Lepturini, *Grammoptera ruficornis* F. and *Alosterna tabacicolor* Deg. were common on the hawthorn blossom and a single adult of *Judolia cerambyciformis* Schrank was taken by Mr. Skidmore on a bracken frond. Two larvae of *Strangalia maculata* were found in rotten oak branches lying on the ground beneath the trees. Under the bark of a dead larch tree, many pupae of *Tetropium gabrieli* were found. Both *Rhagium mordax* and *Rhagium bifasciatum* were common as, indeed, they seem to be almost everywhere. Several other species of Longhorns have previously been recorded from Moccas by other collectors, these include *Prionus coriarius* L., *Pocilium alni* L. and *Pogonocherus hispidulus* (Pill and Mitt). Larvae found in the wood of a dead fruit tree by Mr. B. D. Cooke may possibly have been of this latter species, but as none were collected, this must remain unconfirmed. There are other species which will probably eventually be found here and the locality will undoubtedly repay further investigation.

At the end of June and beginning of July I spent two weeks holiday at Poole in Dorset and during this time I collected in various parts of the New Forest and at Canford Heath and Bere Wood in Dorset. In the Brockenhurst area I re-visited Whitley Ridge where I have in the past regularly found *Leptura sexguttata* F. This species was fairly common again this year, adults being found on umbel flowers, on dogwood, thistles and on the grass and *Juncus* growing on the floor of the rides. Nothing apparently is known of the biology of this species, which is extremely local. However, I have never found it except where growths of beech and oak predominate and I feel sure that its larvae will eventually be found in the wood of either or both of these trees. Heaps of "cordwood" left by the foresters under the trees at the edge of one of the rides were infested with *Phymatodes testaceus* pupae and adults of which were found directly under the bark. In oak branches lying on the floor of the glades larvae and adults of *Strangalia maculata* were found as well as larvae of *Mesosa nebulosa* which were burrowing in the pith channels of fallen narrow rotten oak logs. An adult of this species was found in its pupal cell in a narrow oak branch on 30th

December 1958 at the same locality. Writers frequently refer to this species as attacking the topmost branches of fallen oak trees, but my experience at Moccas and in the New Forest suggests that it attacks the narrower dead branches whether these have fallen off the trees or are still attached. I have frequently found the species in fallen branches lying on the ground. The adults have a perfect cryptic colouring and can be very easily overlooked and their legs are large and powerful so that they are difficult to dislodge by beating. It is, therefore, easier to obtain a series of adults by rearing the larvae. Adults of the following common species were taken from flowers—dogwood umbels, wild rose, thistles and brambles being the most productive: *Strangalia maculata*, *Strangalia melanura* L., *Grammoptera ruficornis* F., *Alosterna tabaci-color* and *Rhagium mordax*. Adults of *Stenocorus meridianus* L. were also found in the same area by Mr. B. D. Cooke but these were taken exclusively on privet flowers. Several dead thorn bushes in the same ride contained larvae of *Pogonocherus hispidulus*, but no adults of this species were found.

Again in the New Forest the old apple trees near Rhamnor inclosure and the hollies in Holland's Wood were beaten for *Pogonocherus hispidus* (L.) but no adults were found although fair numbers of larvae were found in their pupal cells in the dead apple twigs.

Canford Heath, a sandy heath on the north western outskirts of Poole, was visited several times and from one dead pine tree two adults and eight pupae of *Arhopalus* sp. were dug out on 26th June; within the next ten days adults successfully emerged from five of the pupae—the others were preserved. All the adults were *Arhopalus rusticus* L. This species is decidedly uncommon in England, being largely restricted to the Scottish highlands, although it has been recorded before from Dorset. It is very destructive to the pine trees, the larvae making large galleries at the base of the trunk—sometimes they colonise the trunk as high as fifteen feet from the ground—mainly in the sapwood at first—sometimes even in the bark—but succeeding generations penetrate deeper and deeper into the heartwood until the whole lower part of the trunk is honeycombed. When this stage is reached the stump usually becomes too rotten for further attack by this species and *Rhagium bifasciatum* takes over. Roots too are attacked and specimens are often more easily obtained from these than from the trunks of the trees themselves which are frequently extremely hard.

Bere Wood, a very large mainly broadleaved wood between Bere Regis and Bloxworth in Dorset, was visited on 5th July but collecting was cut short after a few hours by a thunderstorm and torrential rain. Several specimens of *Limenitis camilla*—I think our most graceful butterfly—were gliding and wheeling along the rides as I walked into the wood from the road. Looking on the flowers I very quickly found many adults of *Strangalia maculata*, *Strangalia melanura* and *Grammoptera ruficornis*. Some pine logs lying by the side of the ride were infested with larvae of *Tetropium gabrieli*. (Several dead adults of this species were also found under the bark). This was apparently the first time this species had been found in Dorset. Larvae of *Rhagium mordax* were found under the bark of oak logs. A single adult of *Stenocorus meridianus* was seen on a bramble flower. This was one of the largest specimens of this variable species that I had ever seen but unfortunately it fell into the long grass and I was unable to find it

again—yes, the one that got away!

On Sunday, 5th October, whilst staying in Glasgow, I took advantage of a British Railways' cheap day excursion to visit Aviemore in East Inverness-shire. Although a continuous light drizzle fell throughout the day I was able to spend about four hours in Rothiemurchus forest, mainly in the old pine woods on the shore of Loch an Eilein. Adults and larvae of *Rhagium inquisitor* L. were found under the bark of fallen recently dead pines, the adults and larvae of both the other British species of this genus—*R. mordax* and *R. bifasciatum*—were the only other longhorns found, although several adults and larvae of the rare *Pytho depressus* L. were also taken under loose pine bark. These larvae are very similar to those of *Pyrochroa* and they seem to effect similar habits.

It is evident that the study of longhorn beetles is an occupation which can be followed on any day of the year even in the depth of winter when adults of several species can still be found to reward the careful searcher.

REFERENCES.

- Twinn, D. C. (1958). "New county and vice county records of Coleoptera from north Lancashire and Westmorland". *Ent. mon. Mag.*, **94**: 216.
Birkett, N. L. (1958). "Two records of Cerambycidae (Col.) from N. Lancashire". *Ent. mon. Mag.*, **94**: 131.
Fraser, M. G. (1950). "Notes on the biology of *Saperda scalaris* (L.) (Col., Cerambycidae)". *Ent. mon. Mag.*, **86**: 33.
Allen, A. A. (1955). "Notes on some Longicornia from Herefordshire". *Ent. Rec.*, **67**: 88.

DIPTERA

Notes on the Larvae of the British Rhagionidae and Stratiomyidae with a key to the genera

By ALLAN BRINDLE, F.R.E.S.

In a previous paper (1957) I included a key to the families of the larvae of the Brachycera, and it seems appropriate to follow this with a key to the genera of the first two families. Of the various Diptera larvae encountered in ecological studies, particularly studies connected with soil, those belonging to these two families are often prominent, partly on account of their relatively large size. Their taxonomy, however, is still unsatisfactory. Hennig (1952) gives a key to the sub-families of the Stratiomyidae larvae, and both he and Brauns (1954) give an incomplete key to the genera of the larvae of the Rhagionidae. There appears to be no work by which the larvae of both these families can be assigned to their genera, and it is this which the present paper attempts to accomplish.

Although the Stratiomyidae and Rhagionidae are placed adjacent in British taxonomical lists, their larvae form two contrasting groups.

The larvae of the Rhagionidae are cylindrical, the cuticle is smooth and usually devoid of prominent hair or bristles, although the cuticle may possess very short fine pubescence. The two dorsal tracheal trunks

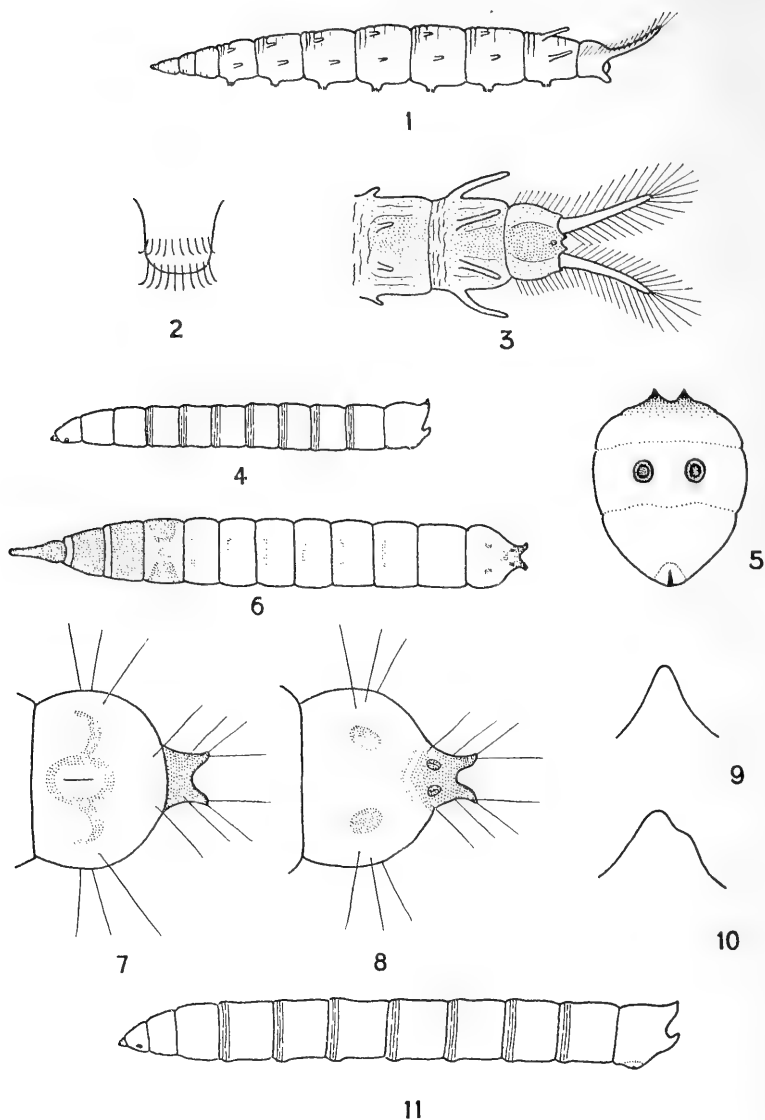
end in widely spaced spiracles placed on the anal segment on an exposed spiracular disc, which may have fleshy lobes surrounding it. These lobes can be closed over the spiracular disc when the disc is retracted. The respiration is typically amphipneustic, with spiracles on the prothorax and on the anal segment (*Atherix* is exceptional since the larvae possess no spiracles and are apneustic). The larvae are active and are saprophagous, phytophagous, or carnivorous. They pupate normally, *i.e.* the pupa is freed as the last larval skin is cast.

The larvae of the Stratiomyidae are broad and rather depressed, the cuticle is roughened, and has a characteristic appearance when seen under moderate magnification (fig. 29), consisting of uneven hexagonal patches. Prominent hairs or bristles occur on the body segments, and the two dorsal tracheal trunks are approximated before the posterior opening so that the spiracles are close together or may be apparently combined. These lie inside a spiracular chamber, the entrance of which consists of a transverse slit close to the posterior of the anal segment. In the aquatic larvae the opening is usually surrounded by long hydrofuge plumose hairs. The type of respiration varies, from amphipneustic to, apparently, peripneustic—in some aquatic larvae the middle abdominal segments also possess spiracles though these are very small, and may prove to be functionless. The larvae are saprophagous, or detritus feeders generally, and are sluggish. The last larval skin is not cast but remains intact, forming a cover and protection for the pupa inside.

RHAGIONIDAE

Key to genera:

- 1(2) Small larvae, mining the leaves of liverworts (*Pellia*, etc.) ...
Spania
- 2(1) Large larvae, free living.
- 3(4) Aquatic larvae; greenish, with prominent abdominal pseudopods (figs. 1, 2); anal segment bearing two processes fringed with long hairs (fig. 3); in running water (rivers with stony beds) ...
Atherix
- 4(3) Terrestrial larvae; without pseudopods.
- 5(6) Head non-retractile, elongated and heavily sclerotised; pro- and meso-thorax sclerotised on dorsum; anal segment bearing an apical sclerotised bifurcated plate (figs. 6, 7, 8); segments bearing long bristles; in decaying wood.....*Xylophagus*
- 6(5) Head retractile; pro- and meso-thorax not sclerotised; no prominent bristles on segments.
- 7(8) Larvae green; and segment with two sclerotised dorsal hooks (figs. 4, 5); in mosses on trees and stones.....*Ptiolina*
- 8(7) Larvae white; anal segment without dorsal hooks; in soil, etc.
- 9(10) Anal segment ending in two fleshy lobes, a dorsal and a ventral (as indicated by dotted lines in fig. 5); in marshy soil
Symphoromyia
- 10(9) Anal segment ending in four fleshy lobes, two dorsal and two ventral, each lobe about equal in length.
- 11(12) Ventral lobes with a sinuate margin (fig. 10); in marshy or damp soil.....*Chrysopilus*



RHAGIONIDAE LARVAE

Atherix ibis (F.). 1, larva, lateral view. 2, pseudopod. 3, posterior segments, dorsal view.

Ptiolina obscura (Fall.). 4, larva, lateral view. 5, anal segment, posterior view.

Xylophagus ater Mg. 6, larva, dorsal view. 7, anal segment, ventral view. 8, anal segment, dorsal view.

Rhagio scolopacea (L.). 9, ventral lobe, 11, larva, lateral view.

Chrysopilus cristatus (F.). 10, ventral lobe.

- 12(11) Ventral lobes with margins evenly curved (fig. 9); in marshy soil or debris, etc.....*Rhagio*

The larvae of the Rhagionidae form three distinct groups, each group worthy of at least subfamily rank:—

1. *Xylophagus*: very distinct from the other larvae on characters given above; Hennig (1952) refers this genus to a separate family the Erinidae (*Xylophagus*=*Erinna*). In Kloet and Hincks (1945) it is put into a subfamily (*Xylophaginae*) of the Rhagionidae.
2. *Atherix*: also shows distinctive characters, though normally placed in the Rhagioninae.
3. *Rhagio*, *Chrysopilus*, *Symphoromyia*, *Ptiolina* (and possibly *Spania*) are all closely allied.

Spania: the larva has not been described, but Seguy (1926) refers to its reported habitat.

Atherix: Length 25 mm., greenish in life, darker dorsally. The body segments are much wrinkled by transverse furrows, and each abdominal segment, except the seventh, bears four short processes, the seventh possessing long ones (figs. 1, 3). These processes are assumed to act as gills since the larva is apneustic. Each abdominal segment, except the last, bears two pseudopods, and each of these is double, bearing two sets of long sclerotised hooks arranged in two rows (fig. 2). The hooks fold in together as the pseudopod is retracted. The last segment has one median pseudopod, and between this and the fringed processes are a pair of white anal papillae: The anus lies between these. The larvae are carnivorous. The curious method of oviposition of this species is described in Colyer and Hammond (1951).

Xylophagus: Length 18 mm., whitish or yellowish, with the sclerotised areas reddish brown. Short transverse bands of sclerotisation occur towards the anterior margins of the first six abdominal segments, assisting locomotion. It is the only larva in the family to exhibit a prominent chaetotaxy. The posterior spiracles are borne on the apical plate. The larvae are carnivorous on other larvae in the decaying wood.

Ptiolina: Length 7 mm., shining green in life. The anal segment has two fleshy lobes, not sharply demarcated (shown as dotted lines in fig. 5), a dorsal and a ventral. Each abdominal segment has a roughened striated circular band towards the anterior margin (fig. 4) which assists movement. The larvae feed on the mosses on trees and stones, and are the least active of this family.

Symphoromyia: described, but not figured, by Beling (1882). The characters used in the key are from Hennig (1952). It is apparently very similar to *Rhagio*.

Chrysopilus: *Rhagio*: both similar (fig. 11). Length up to 24 mm. depending on the species, whitish, with a rather transparent cuticle. The anal segment ends in four lobes, the shape of the ventral lobes being the most useful means of separating these genera. Towards the anterior margin of each abdominal segment is a circular band similar to those found in *Ptiolina*. The larvae are partly carnivorous but there is evidence that they do feed also on decaying vegetable material.

STRATIOMYIDAE

Key to genera:

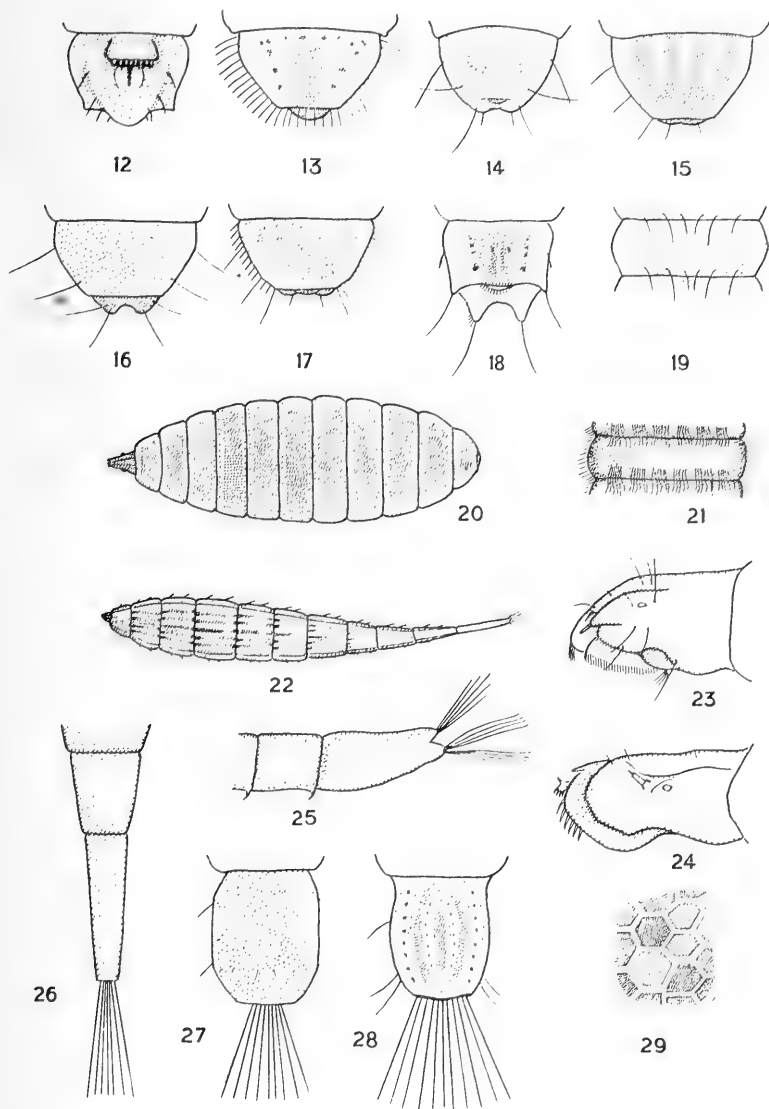
- 1(14) Terrestrial larvae; last abdominal segment not elongated, usually semi-circular, and without tufts of long hairs around the opening of the spiracular chamber.
- 2(3) Larvae myrmecophilous *Ephippium*
- 3(2) Larvae not myrmecophilous.
- 4(5) Pro- and meso-thorax not roughened on middle of dorsum; anus bordered anteriorly with a transverse row of strong posteriorly directed teeth (fig. 2); in decaying wood..... *Solva*
- 5(4) Dorsum of thorax roughened as the rest of the dorsum; teeth confined to the longitudinal margins of the anus.
- 6(9) Abdominal segments with prominent hairs, either on the middle of the segments or in tufts near the posterior margins.
- 7(8) Abdominal segments with shaggy hairs in tufts towards the posterior margins (fig. 21); anal segment rounded with obvious hairs but without bristles (fig. 13); in dung, soil, etc..... *Beris*

STRATIOMYIDAE LARVAE

- Solva maculata* (Mg.). 12, anal segment, ventral view.
- Beris chatybeata* (Forst.). 13, anal segment, dorsal view. 20, larva, dorsal view. 21, fifth abdominal segment, dorsal view.
- Pachygaster leachii* Curt. 14, anal segment, dorsal view. -
- Geosargus iridatus* (Scop). 15, anal segment, dorsal view.
- Chloromyia formosa* (Scop.). 16, anal segment, dorsal view.
- Microchrysa cyaneiventris* (Zett.). 17, anal segment, dorsal view.
- Nemotelus pantherinus* (L.). 18, anal segment, dorsal view (after Hennig).
- Pachygaster leachi* Curt. 19, fifth abdominal segment, dorsal view.
- Stratiomys potamida* (Mg.). 22, larva, dorsal view.
- Odontomyia ornata* (Mg.) 23, head (after Hennig). 26, anal segments, dorsal view.
- Nemotelus pantherinus* (L.). 24, head (after Hennig).
- Odontomyia viridula* (F.). 25, anal segments, lateral view.
- Odontomyia tigrina* (F.). 27, anal segment, dorsal view (after Hennig).
- Oxycera trilineata* (F.). 28, anal segment, dorsal view.
- Chloromyia formosa* (Scop.). 29, cuticle, showing hexagonal pattern.

- 8(7) Abdominal segments with hairs prominent on middle of dorsum, obscuring details of the cuticle; anal segment rounded with short hairs and bristles (fig. 17); in dung, soil, etc..... *Microchrysa*
- 9(6) Abdominal segments without prominent hairs, these being short and inconspicuous and not obscuring the details of the cuticle; anal segment rounded with long bristles.
- 10(11) Abdominal segments with four to six bristles, often of unequal length (fig. 19); anal segment rounded with very long bristles (fig. 14); in decaying wood..... *Pachygaster*
- 11(10) Abdominal segments with six bristles of equal length, widely spaced; in dung or soil, etc.
- 12(13) Dorsum with longitudinal undulating darker stripes; anal segment not produced below the spiracular opening (fig. 15)..... *Geosargus*
- 13(12) Dorsum uniformly coloured; anal segment produced below the spiracular opening (fig. 16)..... *Chloromyia*
- 14(1) Aquatic larvae; last abdominal segment not semi-circular, but elongated or angular; usually with long plumose hairs around the spiracular opening.

15(18) Antennae near eyes, far removed from anterior border of head (fig. 24).



- 16(17) Anal segment angular, with long bristles, and without very long hairs around the spiracular opening (fig. 18); in marshy soil, usually near the coast.....*Nemotelus*
 17(16) Anal segment without projections, not so angular; bristles smaller; long plumose hairs around the spiracular opening (fig. 28); in marshy soil, aquatic mosses, etc.....*Oxyccera*

- 18(15) Antennae near anterior border of head (fig. 23).
 19(20) Last abdominal segment shorter (figs. 26, 27); penultimate and ante-penultimate segment with a pair of small sclerotised ventral hooks (fig. 25); in marshy soil.....*Odontomyia*
 20(19) Last abdominal segment longer (fig. 22), and without ventral hooks; in marshy soil.....*Stratiomys*

The larvae of the Stratiomyidae form a much more homogeneous group than those of the Rhagionidae. Although a distinction exists between the terrestrial and aquatic larvae this is merely one of degree and all appear to have the major features in common. The present system of subfamilies found in Kloet and Hincks (1945) appears to agree in general with the structure of the larvae.

Ephippium: the larva has not been described; Seguy (1926) mentions reports of it being found in the nests of *Lasius fuliginosus* (Latr.). In the key it is assumed to show the characters of the terrestrial larvae, though taxonomically it is closely allied to *Nemotelus*.

Solva: a brief description of the larva and pupa is given in Colyer and Hammond (1951); the characters used in the key are from Hennig (1952).

Beris: Length 8-9 mm., rather broad and depressed (fig. 20); dark brown in colour, lighter on borders and margins of the segments. The anus is bordered with teeth, but these are confined to the anus and no transverse row appears anterior to it as in *Solva*.

Microchrysa: Length 8 mm., light yellowish or brownish, the marginal hairs on the anal segment are shorter than in *Beris*; the band of hairs on the middle of the dorsum of the abdominal segments is most distinctive; the anal bristles are short, and the anus is bordered with teeth.

Pachygaster: Length 7 mm., light brown, the bristles being much longer in proportion than in other genera. Seguy (1926) gives figures of most of the larvae.

Geosargus: Length 12 mm., yellowish-brown with darker stripes; anal bristles longer in proportion than in *Microchrysa*. The anus is bordered with teeth.

Chloromyia: similar in size and shape to *Geosargus*, the separation characters are given in the key. It appears to be more or less confined to dung.

Nemotelus: the characters used in the key are from Hennig (1952); Seguy (1926) gives figures of some of the larvae.

Oxycera: Length 7-8 mm., broad and depressed, often with a distinctive pattern on the dorsum, the general colour being yellowish or brownish grey.

Odontomyia: the larvae vary in size, and in the shape of the anal segment. *O. ornata* (Mg.) (fig. 26) has a long anal segment, not unlike that of *Stratiomys*, whilst *O. tigrina* (F.) (fig. 27) has a short one similar to that of *Oxycera*.

Stratiomys: Length 36 mm., greyish with vague patterns of stripes (fig. 22), these being usually masked by a covering of mud.

The larvae of *Chorisops tibialis* (Mg.) are assumed to resemble those of *Beris*, whilst those of *Vanoyia tenuicornis* (Macq.) are probably similar to those of *Oxycera*.

REFERENCES.

- Beling, T., 1882. Beitrag zur Metamorphose zweiflügeliger Insekten aus den Familien Tabanidae, Leptidae, Asilidae, Empididae, Dolichopodidae, und Syrphidae. *Arch. Naturg.* **44**.
- Seguy, E., 1926. *Faune de France*, **13**, *Dipteres (Brachyceres)* Paris.
- Kloet, G. S., and Hincks, W. D., 1945. *A Check List of British Insects*. Stockport.
- Colyer, C. N., and Hammond, C. O., 1951. *Flies of the British Isles*, London.
- Hennig, W., 1952. *Die Larvenformen der Dipteren*, **3**. Berlin.
- Brauns, A., 1954. *Terricole Dipteren Larven*. Berlin.
- Brindle, A., 1957. Notes on the Biology of North-East Lancashire Brachycera (Diptera). *Ent. Rec.*, **69**.

The Diptera about Dale Fort Field Centre, Pembrokeshire

By L. PARMENTER.

The need to see how 'Field Centres' functioned coincided with the opening of a centre in Pembrokeshire at Dale Fort in 1948 and I spent some ten days in August of that year with the small band of students visiting the new centre. After several holidays in Cornwall, I wished to compare these two western counties. I had already heard that Choughs were more numerous in Pembrokeshire than in Cornwall. The warden, Mr. J. H. Barrett soon introduced the party to the shore and rock fauna—sea anemones, lug-worms, etc. Peregrines, Choughs, the many waders and sea birds attracted much attention as did the various flowers still blooming in the humid countryside. But time for collecting and observing diptera was found on most days despite some long spells of continuous rain.

The Centre is at Dale Fort, overlooking the sheltered Dale Roads at the entrance to Milford Haven and is 15 miles from Haverfordwest. It serves as the depot for visitors to the Skokholm Island Centre. The peninsula is mostly of Old Red Sandstone with Boulder Clays overlaid on the western end. Deciduous woods are close to the fort and at Marloes Bay, to the north, the fossiliferous Silurian limestone attracts the attention of visitors to the district.

The bird, marine fauna and flora have been well studied in the years since the centre's opening but entomologists have been few at the Centre and their published reports or records meagre. It is hoped that others will record their observations and collecting experiences at the 'Fort'. The attractions for 'working' from a Field Centre are the laboratory facilities when returning with the day's collecting and the pleasant and informed naturalists one meets at meal times and for discussions afterwards as well as in the 'field'.

THE DALE DIARY

- Aug. 1—Both Castle Beach and the Gann estuary were visited, sunny and warm.
- Aug. 2—Dull with rain at times. Castle Beach Wood was visited during the day. A small catch of Lepidoptera and fewer Diptera.
- Aug. 3—Dull and damp morning enlivened by sights of Raven and Buzzards. A little collecting at Castle Beach and a trip to the Gann saltings in the afternoon.

- Aug. 4—A lovely sunny day. Tramped to Martins Haven via Marloes to show the Choughs to the ornithologists.
- Aug. 5—A damp morning with the vegetation too wet for sweeping. In the afternoon, Castle Beach Wood was visited by wading up the stream, collecting from the stream-side vegetation.
- Aug. 6—A soaker. Spent bird watching along the Gann estuary, brightened by the visit of a Peregrine to the great dismay of the waders and the gulls.
- Aug. 7—Castle Beach Wood visited on this sunny morning although the vegetation was still soaking wet at 10 a.m. The sunny afternoon made the visit to the Gann estuary profitable for collecting.
- Aug. 8—Heavy rain throughout the day and very little collecting or observation.
- Aug. 9—A sunny morning at the Gann estuary provided an abundance of diptera but by the afternoon it had turned dull and the flies were less evident.
- Aug. 10—The morning was sunny and the flies, at first few, gradually became more numerous until it became overcast in the afternoon.

In all about 700 specimens were taken. Thus a sample list of the flies present in August in the area was obtained. The species are now discussed in groups under the chief habitats in which they occurred. It will be noted, however, that few of the Nematocera were collected. One surprise was the complete absence of *Eristalis arbustorum* L.

DALE BEACH

On the pebbles close to seaweed, there was an abundance of both the Empid *Chersodromia arenaria* Hal. and the Sphaerocerid *Thoracochaeta brachystoma* Stenh. and a single *Coprophila vagans* Hal. was taken.

The carpet of seaweed was more populated, the species:—*C. arenaria* Hal. and *C. difficilis* Lund., *Scatopse transversalis* Lw., the Sepsid *Themira leachii* Mg., of the Coelopidae—*Orygma luctuosa* Mg., *Coelopa pilipes* Hal. and *frigida* F., the Scatophagid *Ceratinostoma ostiorum* Hal. and the Muscids *Fucellia fucorum* Fln. and *maritima* Hal. The pools among the seaweed were frequented by females of *Eristalis tenax* L., possibly egg-laying.

Over the rocks at the foot of the cliff were more of *Ceratinostoma ostiorum* Hal. and *Fucellia maritima* Hal. with the Dolichopodidae—*Aphrosylus celtiber* Hal. and *raptor* Walk.

CASTLE BEACH

Here the seaweed was piled thickly and swarmed with flies with *Eristalis tenax* L. females visiting the pools amongst the seaweed. The species noted were *Chersodromia arenaria* Hal., *Themira leachii* Mg., *Thoracochaeta brachystoma* Stenh., *Coprophila vagans* Hal., *Orygma luctuosa* Mg., *Coelopa pilipes* Hal. and *frigida* F., *Fucellia fucorum* Fln. and *maritima* Hal.

On the pebbles and stones of the stream flowing into the sea, there were several species of Dolichopodidae—*Liancalus virens* Scop., *Dolich-*

opus unguulatus L. and *griseipennis* Stann., *Hercostomus cretifer* Walk., *Hypophyllus obscurellus* Fln. and *Xiphandrium caliginosum* Mg. (sensu Verrall and Collin). Associated with them were *Tipula lateralis* Mg., the Empid *Drapebis ephippiata* Fln., the Sphaeroceridae *Spinotarsella humida* Hal., *Collinellula tutosa* Stenh., and *palustris* Collin and the Ephidrid *Parydra coarctata* Fln., and the Muscidae—*Muscina papulorum* Fln., *Caricea tigrina* F. and *Linnophora maculosa* Mg.

BRACKEN AREA

Between Dale Fort and Castle Beach Wood stretched an area smothered with bracken on which rested many flies, mostly Muscidae and Syrphidae. Those noted were *Tipula lateralis* Mg., *Rhagio lineola* F., *Tabanus sudeticus* Zeller, *Dolichopus griseipennis* Stann., *D. unguulatus* L., *Melanostoma scalare* F., *Scaeva pyrastris* L., *Syrphus glaucius* L., *S. vitripennis* Mg., *S. ribesii* L., *S. tricoloratus* Fln., *S. balteatus* Deg., *Rhingia campestris* Mg., *Eristalis pertinax* Scop., *E. tenax* L., *Nyctola segnis* L., *Minettia rivosus* Mg., *Tricholauxania praeusta* Fln., *Coelopa frigida* F., *Thelaira nigripes* F., *Zenillia vulgaris* Fln., *Pollenia rudis* F., *Melinda anthracina* Mg., *M. caerulea* Mg., *Onesia agilis* Mg., *Calliphora vomitoria* L., *Musca autumnalis* Deg., *Graphomyia maculata* Scop., *Mesembrina meridiana* L., *Phaonia errans* Mg., *Hydrotaea irritans* Fln., *Fannia serena* Fln., *Helina duplicata* Mg., *Hylemyia strenua* R.D., *Pegomya bicolor* Wied. and *Anthomyia procellaris* Rond.

(To be continued.)

Current Notes

We have received from the Entomological Liaison Committee with the Nature Conservancy an interesting circular from the Conservancy pointing out that after an investigation by the various research bodies into the chemical spraying of wayside verges, circular 718 of the Ministry of Transport and Civil Aviation has been issued to all appropriate local authorities on 31st August 1955. This circular reads as follows:—

"The Ministry of Transport and Civil Aviation has now agreed with the Nature Conservancy that no objection will, in future, be raised to the use by highway authorities of selective weed-killers containing substituted phenoxyacetic acids for control of roadside vegetation, subject to the following conditions:—

"1. Spraying should be carried out only on trunk and class I roads and on certain dangerous corners on class II roads, and at the earliest susceptible stage of growth which, in the south of England, is usually reached at the beginning of May.

"2. On wide verges, spraying should be limited to within 10 feet of the road edge except where stands of injurious weeds occur.* On

*Injurious weeds are defined by statute as: spear thistle (*Carduus lanceolatus* L.), creeping or field thistle (*Carduus arvensis* Curt.), curled dock (*Rumex crispus* L.), broad-leaved dock (*Rumex obtusifolius* L.) and ragwort (*Senecio jacobaea* L.).

the narrower roads care must be taken to avoid spraying the hedge and immediate vicinity. It is emphasized that drift in windy weather is a serious hazard to adjacent hedgerows and to susceptible crops and garden plants.

"3. In certain cases, highway authorities may be asked to leave unsprayed sections on class I roads, where interesting species or communities occur.

"4. The practice must still be regarded as experimental and subject to review in the light of further experience.

The committee points out that the Agricultural Research Council considers this use of selective weedkillers as a means for controlling the growth of the proscribed weeds and not for their extermination. The Conservancy is expressing concern about the future of roadside verges and of hedgerows in general because of the plant and insect life they harbour, pointing out that beside pests, there are pollinating insects, and predators on the pests, and suggesting that those interested and able to do so should give this matter attention during the coming few years.

It is also mentioned that during the past two years complaints have been received that certain highway authorities have been disregarding the terms of the circular, and the Ministry of Transport has been notified of these; also where detailed information is available the authority concerned can be approached. To obtain best results it is necessary to have full details of the site (with map reference) and time of the spraying, and it will be of great value to the conservancy if entomologists and botanists will have this well in mind when communicating such complaints. It is also pointed out that notes on the results of any spraying observed at intervals following the application would be most useful.

The wider question of the risk to wild life resulting from the agricultural use of toxic chemicals has also received consideration from the Conservancy and from 1956 it has been represented on the committee concerned with the matter. Here again, information about well-substantiated cases of damage to or reduction in invertebrate populations will be welcomed by the Conservancy at 19 Belgrave Square, S.W.1.

S. N. A. J.

Dr. Kettlewell has pointed out that in our note on the account of his expedition to Brazil (antea, p. 58) we have made two mistakes; the first is that Dr. Kettlewell *was* the expedition, and the second, we are happy to relate, is that "*Endeavour*" has offered him four full pages, so that his pictures will, after all, be placed on record for posterity.

S. N. A. J.

Collecting Notes

Trichiura crataegi L., the pale eggar, is a widely distributed species and feeds on a variety of forest trees and shrubs, willow, hawthorn,

blackthorn, bilberry, heather, and so on. As it is prone to move about in the daytime and is a rather conspicuous larva we have all come across it at one time or another and reared it to the imago. In winter time the eggs, being laid on bare twigs, are easy to find. But if you want to adorn your collection with a series of really splendid imagines, larger and darker than those found in any other county, you must go to Lincolnshire and search the hawthorn hedges on the edges of the fen districts, or 'carrs' as they are called locally, between 8 o'clock and 9 o'clock, G.m.t., on a warm evening during the first week of June. For it is then that the larva crawls up from the interior of the hedge to the tender shoots at the tops of hedges which have been trimmed the previous year, and are easily seen. "We have heard of forty being taken in three evenings in this way". So wrote one of our elders and betters many years ago.

Perhaps these Lincolnshire *crataegi* were a 'local race' and this would seem to be not unlikely since there is no doubt that in different parts of the country this insect is associated with particular foodplants. Thus Horne wrote (*Ent. Rec.*, 11: 165) that in Aberdeenshire it is a moorland species and "the larvae are essentially heather feeders; but, like . . . most other heather feeders, they wander occasionally, and are to be found on bilberry or low sallow bushes". Moberly asserted (*ibidem*, p. 112) that in the New Forest it was confined to sallow. Others have recorded that in Essex it is to be found only on hawthorn, even though sallow grow alongside the hawthorn. The consensus of opinion seems to be that on the east side of this island the food is invariably hawthorn. In mid-Wales the writer of these lines found it only on birch. Horne had an interesting note about the matter in *Ent. Rec.*, 11: 191).

"Our northern form of this insect", he wrote, "although it has not a varietal name known to me, is perfectly distinct in colour from the southern type. Aberdeenshire specimens vary little among themselves, but are all much darker, with little or no trace of the whitish ground colour visible. In all the southern examples that have come my way, the difference between the two forms is quite striking when a series of each is compared". To this Tutt appended the editorial query: "Is not this the var. *ariae* Hb.?" Which of course raises the question whether a territorial form of an insect which breeds 'true to type' comes within the definition of a 'variety'.

It may well be that this darker form extends along the eastern side of Great Britain—but how far south does it come? The Essex specimens we have seen are distinctly of the pale 'southern' form. So are the Welsh ones. Also, it would be interesting to know if any of our readers have found that specimens of this insect taken on the fringes of, or in, the fens are larger and more heavily marked than those from higher and drier ground. Barrett says nothing about the 'northern' and 'southern' forms and labels a dark female "female var." (*Lep. Br. Is.*, 3, pl. 87, fig. 2b). Can those of our readers who have specialised in this insect tell us more about it? It seems very unlikely that these Lincolnshire and Aberdeenshire specimens are only, one and all, aberrations.

Don't forget the value of scarlet runner beans (the green pods) as a foodplant during the coming season. An extraordinary variety of lepidopterous larvae will eat these pods readily — among others *V. cardui*, several of the 'Blues', green hairstreak, and many moths including the *Heliothis* genus, *Pyrrhis umbra*, probably most of the genus *Amathes*, many of the genera *Agrotis* and *Plusia* and of course all omnivorous species such as the broom moth, *pisi*. Perhaps the pods of runner beans are second only to knotgrass as a "universal foodplant" in the lepidopterist's garden.

O. M. H.

COLLECTING AMATHES AGATHINA DUP.—The late Dr. Harold King recorded in his diaries that the latter half of May is the best time to work for the larvae of *Amathes agathina* Dup. The best localities are where heather grows luxuriantly in sheltered spots or on banks that overhang gullies or sunken tracks across heathland. There are three methods of working for these larvae: (1) beating, (2) sweeping, (3) searching after dark with a lamp. Occasionally a larva may be found sitting exposed on the heather or dry grass bents in the daytime.

Dr. King found that he got the best results by beating large masses of heather in sheltered spots, where the tray could be put right underneath the growth. Probably an old umbrella would be easier to handle than a tray. Dates on which he did best were 17th, 18th and 25th May. Sweeping was much less productive than beating.

H. S.

Notes and Observations

VANESSA ATALANTA LINN.: AN EARLY DATE.—On 28th February I saw a *Vanessa atalanta* Linn. flying in my garden here. This must surely have been a hibernated one.—S. C. S. BROWN, F.R.E.S., 142 Richmond Park Road, Bournemouth. 27.iii.59.

ANTIGASTRA CATALAUNALIS DUP. IN KENT.—In my mercury vapour trap on 5th September 1958 I found a perfect specimen of a Pyralid I did not recognize. It was subsequently identified for me as *Antigastrea catalaunalis* Duponchel. A second specimen, in a very worn condition, came to the trap on 14th September. These specimens were exhibited at the South London Entomological and Natural History Society by the Baron de Worms.

It appears that hitherto this rare migrant has only been taken singly in this country. It is not a new species for Dover, however, since Leech (1886) *British Pyralides*, p. 45, gives "Loc. near London, near Dover", but does not give any details. It was therefore included in the local list published in 1949. A specimen was taken at Cheshunt, Herts, in September 1867 by Mr. W. C. Boyd (Barrett (1904) *Lepidoptera of the British Islands*, IX: 253). I am told that Mr. Bainbrigge Fletcher took one specimen in Gloucester some years ago, but I do not know the date.

The foodplant is given by Leech as *Linaria spuria*, to which Lhomme adds *Antirrhinum latifolium*. Abroad it has a wide distribution

through southern and western Europe, Italy, Dalmatia, Austria, Asia Minor, Aden, Arabia, India, tropical Africa including the Congo and Nyasaland, and also South Africa (Barrett). It appears to be double brooded abroad as fresh specimens occur in April and May as well as in the Autumn.—G. H. YOUNG, 18 Castle Avenue, Dover.

PRECOCIOUS PANAXIA DOMINULA LINN.—Mr. H. Symes' interesting account of breeding a single imago of *P. dominula* on the 10th November (*Ent. Rec.*, 71, 30-31) encourages me to record my own experiences with larvae from the same lot (sixteen) that were selected at the beginning of October as showing a marked inclination to continue feeding, being even then well advanced toward third instar, whilst the remainder had then begun to take up their positions for hibernation.

Until the first week in October the larvae had been fed upon *Symphytum officinale* (comfrey) but with the decline of that plant the (sixteen) larvae were given *Lamium album* (white dead-nettle) and brought indoors. Throughout their life the temperature would rarely drop lower than 65° F., the perspex containers in which they were then housed having been placed upon a warm shelf in the kitchen.

Indoors, they continued feeding steadily, showing no disposition to hibernate, and when I received Mr. Symes' letter on the 13th October informing me of his unanticipated success in obtaining a pupa—the larva having spun up in its penultimate instar and finally pupated on the 11th October—it was an added inducement to think that possibly Mr. P. J. Burton's success with a second brood of *dominula*, as recorded in Vol. 67 of the *Record*, may not after all be unique.

Towards the end of November when all these larvae had moulted, and were then in their third instar, I noticed, one by one, that some had failed to continue feeding, whilst with the exception of four, whose brief life history I give below, the others only half-heartedly made an effort to continue, and shortly after that they died off singly, over a period of two weeks.

Of the four larvae which had outstripped by now the others, and were one by one approaching full-fed stage, eventually three pupated, the other died when nearly full grown on 20th November. The most advanced of the three spun a flimsy cocoon on the 23rd-24th November, remaining for so many days before completing its metamorphosis—eight days—that I began to think it would never succeed; however, on the 2nd of December it pupated and on the 28th of the month the forewing colouration was to be seen. On the 2nd of January the insect emerged—a female of average size and a typical specimen. The second larva began to spin its cocoon on the 19th December, pupating on the 23rd of the month, and was noted on the 17th of January as showing colouration of the wing-cases; it emerged, a male, on the 24th of that month. Meanwhile the third larva which was almost full fed finally spun its cocoon on 27th January, actually taking eight days before making its metamorphosis. On the last day of February colour could be seen in the wing cases, and four days later, on 4th March, the insect—a female of rather larger than average size, but again a typical specimen in colour and pattern of wings, emerged.—E. W. SMITH, 93 Craithie Road, Town Moor, Doncaster. 31.iii.59.

ADDENDA TO THE COLEOPTERA OF THE CALDBECK FELLS: (Ante 83-86).—The following beetles may be added to the list published in the March issue of the *Record*:—*Miscodera arctica* Pk., *Trichocellus placidus* Gy., *Oxyptoda elongatula* Al., *Ocyusa inerassata* Mt., *Amischa analis* Gr., *A. soror* Kr., *A. cavifrons* Sh., *Quedius nigriceps* Kr., *Q. attenuatus* Gy., *Philonthus laminatus* Cz., *P. fuscipennis* Mn., *Lathrobium brunnipes* F., *Arpedium brachypterum* Gr., *Sitona flavescens* Mn. and *Ceuthorhynchus contractus* Mm.—W. F. DAVIDSON, 9 Castlegate, Penrith.

CATOCALA HYMENAEA SCHIFF: A CORRECTION.—In my account of my holiday last summer (*Ent. Rec.*, 70: 205) I mentioned the capture of a yellow hindwinged *Catocala* and suggested that it might have been *hymenaea* Schiff. Dr. Ramon Agenjo of Madrid, who is at present engaged in monographing the Spanish *Catocala*, informs me that he has no authentic record of *hymenaea* from Spain, and in response to his request for the specimen for more precise determination I had regretfully to reply that as I only collect the microlepidoptera I had released the *Catocala* after examination, and my determination was the result of comparing a memory picture with the figures of yellow *Catocala* in Spuler; so in the circumstances, this cannot be accepted as a reliable record. Dr. Agenjo suggests that my specimens were either *C. nymphaea* Esp. or *C. nymphagoga* Esp., both of which species have been considered in recent years as a serious pest to *Quercus ilex* and possibly also of *Q. suber*, the cork oak, and it is only reasonable to bow to Dr. Agenjo's superior knowledge. It only remains for me to offer my apologies for having jumped to conclusions.—S. N. A. JACOBS, 54 Hayes Lane, Bromley, Kent.

AN OLD COLLECTION.—I have never thought much of collecting moths and butterflies with a cheque book (apart from a natural discouragement by my wife!); there would be so much of the enjoyment lost, the planning of an expedition, with activities limited, at any great distance from home, to week-ends. The odds of the weather more against one in most seasons. The bug you may be looking for quite likely does not turn up, but the unexpected sometimes does, and even an unsuccessful effort is in some ways something of an achievement. With these thoughts in mind I was told of an old collection of moths and butterflies, some from Northamptonshire, which were in a cabinet now in the hands of a medal collector who simply wished to raise a pound or two to set against the cost of the cabinet, and at the same time empty the drawers for his medals. After some correspondence, I went to see this man at Coventry, because, I thought, there might be some old country records of value. As things turned out, this was not the case, but I eventually finished up by purchasing for a couple of pounds all the specimens I wanted. The butterflies had been obviously picked over, but the moths, in spite of their age, were in fine condition, and all with data labels.

During the first check through I noticed three extinct species. These were 3 *L. gueneei*, St Annes, 1912; 1 *A. atriplicis* from Cambridgeshire, 1891, and a short series of 8 *Z. meliloti*, New Forest, bred 1909. Other species which I found of interest were as follows:—In

short series—*C. promissa*, *C. sponsa*, *T. cracca*, *L. cuculla*, *O. carmelita*, *C. cribrum*, *L. putrescens*, *C. alsines*, *C. solidaginis*, *A. myrtilli*, *A. cordigera*, *Z. exulans*, *Z. purpuralis*, *E. irrorella*, *L. lutarella*, *L. caniola*, *L. sororcula*, *A. myricae*, *A. agathina*, *A. praecox*, *N. glareosa*, *X. conspicillaris*; and also odd ones and twos of *N. sparganii*, *N. dissoluta*, *C. phragmitidis*, *D. caesia*, *P. intereogationis*, *M. venustula*, *H. hispidus*, *T. extrema*, *P. plumigera*, *D. cultraria*, *D. lacertinaria*, and lastly but by no means least, 26 *C. frazini*, the data for these indicating that they were bred from an original female captured at Horsham, 3rd September 1908, by A. James.

The above specimens were in the collection of a Mr. F. J. Rasell who lived at Duston, near Northampton. He was a member of the Northampton Natural History Society around and up to 1914.—P. J. GENT, 3 Irthlingborough Road, Wellingborough, Northants.

ABUNDANCE AND HABITS OF *LUPERUS CIRCUMFUSUS* MARSH. (CHRYSOMELIDAE) IN A SURREY LOCALITY; AND A SUBMELANIC FORM.—This rather pretty species, widely dispersed in the southern counties from West Kent (one record only) to Devon, was regarded as locally common by the older generation of collectors; see, for instance, Fowler (1890, *Col. Brit. Isl.*, 4: 324). Possibly this is still true to-day, but my impression is—judging from both my own experience and that of other collectors who have reported much the same thing—that it is at the present time a good deal more localized and, except in comparatively few places, tends to occur very sparingly indeed. Up to last year I had met with it in three localities only (Saunton, N. Devon; Sway, on the southern edge of the New Forest; and Parley Heath, Dorset) but, what is more remarkable, merely a solitary specimen at each place. It was, therefore, interesting to come across this beetle in plenty on Banstead Down, near Carshalton, Surrey, on the afternoon of the 12th July last, while in the company of my friend Mr. Dudley Collins, who first drew my attention to it. It occurred on the common gorse (*Ulex europaeus*), and not on the dwarf gorse (*U. nanus*) which Joy (1932, *Pract. Handb. Brit. Beetles*, 1: 402) gives as the food-plant; but, as is evident from Fowler (*l.c.*), it is not a monophagous species and sometimes feeds on such allied plants as *Sarothamnus* and *Genista*. This would accord with the distinctly polyphagous habits of our other two species of *Luperus*. It is, however, open to doubt whether *Calluna* (mentioned by Fowler) is a true host of *L. circumfusus*; owing to the fact that gorse and ling are often associated, the insect may at times stray on to the latter.

On Banstead Down it appeared to be somewhat 'patchily' distributed over the smallish area covered by us on that occasion. On favoured bushes many specimens, including pairs, could be seen resting or feeding towards the tips of the tender shoots of the same year's growth, but (as is the case with a number of brightly-coloured beetles) they were hardly as conspicuous *in situ* as might be supposed. To collect a good series was of course a matter of no great difficulty, nevertheless their remarkable wariness, combined with the plant's spininess, caused it to take longer than expected. They had a habit of dropping very readily to a lower spray when alarmed, and would sometimes take flight in the warm sunshine. Yet it seemed impossible to dislodge them in any quantity by beating the bushes over the

sweeping-net—searching proved far more effective. It may be that this dexterity in evading capture is one reason why the species is not more often found in numbers. The sole variation encountered was a sub-melanic example having the normally yellow parts dark smoky brown, only obscurely lighter than the adjoining black.—A. A. ALLEN, 63 Blackheath Park, S.E.3. 10.iii.59.

DASYTES NIGER L. (MELYRIDAE) ON THE CHILTERNs.—The paucity of records for this (with us) very local beetle prompts me to make known the capture of a male and female by sweeping mixed herbage and flowers, especially rockrose, on a chalky slope of the downs near Cholsey, Berks., 13.vi.58. Unless they were stragglers from a colony somewhere in the vicinity, or unless it was a little too early or late—some species of the genus differ in time of appearance, thus *D. flavipes* auct. Brit. is later than *D. aerosus* Kies.—it seems that *D. niger* must be very rare in that particular spot, as I spent most of the day, which was warm and bright, sweeping over a considerable area—hoping to turn up *Cryptocephalus primarius* Har.—without seeing another *Dasytes*. It is not, however, new to Berkshire, for the late Philip Harwood found it commonly on flowers of pinks in a garden at Newbury (cf. Fowler & Donisthorpe, 1913, *Col. Brit. Isl.*, 6: 278). Before that it had been taken practically only in the New Forest—mostly, I believe, in one restricted area near Brockenhurst; but I could never find it there, nor have I any record of its capture there or indeed elsewhere in recent times—i.e. since the few given in the work just cited (*l.c.*)—except a doubtful one from the Forest of Dean. This species can at once be known by the deep black colour without a leaden or brassy reflection, its shorter form, and slightly transverse prothorax.—A. A. ALLEN, 63 Blackheath Park, S.E.3. 10.iii.59.

Current Literature

BRITISH INSECTS.—A simplified key to the orders by P. Skidmore, F.R.E.S., is published by Flatters & Garnett at 2s. 6d. (plus postage) and consists of 18 pp., illustrated throughout with good line drawings of representatives of the various orders. Arthropods outside the Insecta are mentioned and there is also an illustrated account of the various types on insect mouth parts. Page 8 to the end gives a simple key to the orders, and on the back cover is a short glossary. This is a good introduction to the Insecta for students and is a stepping stone to the Royal Entomological Society's handbook to the orders.

FLORA OG FAUNA.—The March number of this interesting Danish nature magazine has a very good proportion of material interesting to lepidopterists. There is a local list of the vegetation of a coastal region with a map and two photographs of the general scene, but unfortunately no English summary. Then there is a good account of *Coenonympha tullia* Mull. in Denmark with two plates each of ten figures and text diagrams and an English summary which gives a good lead to understanding the Danish script. *Pionea verbascalis* Schiff. and *Eromene ocella* Haw. are recorded as species new to Denmark; they were both

taken at m.v., the former at Oelene on 7th July 1956 and the latter at Randklive on 10th September 1958, and new aberrations of *Cerura bifida* Hb. and *Malacosoma castrensis* L. are described, namely ab. *optileta* of *bifida* and ab. *serena* of *castrensis*.

ZEITSCHRIFT DER WIENER ENT. GESELLSCHAFT, 1958, pt. 12, and 1959, pts. 1, 2 and 3 have reached us this week. In the 1958 part there is an account of *Sedina buettneri* Hering as a new species to the Austrian list and also of *Eupista (Coleophora) salicorniae* Hein & Wock. Karl Burmann describes *Eriocrania alpella* as a species new to science from the Vennatal, with beautiful photographic figures of this species, and *E. unimaculella* Zett. by Dr. Jakh, and genitalia preparation by Dr. Klimesch with that of *E. salopiella* Stt. from Pierce & Metcalfe for comparison. F. Kasy states *Thiodia citrana* var. *major* as a good species, and *citrana* var. *sardiniana* Schaw. as a subspecies of *Thiodia major* Rhl. with ♂ genitalia figures of both. E. Kromer writes on *Pieris bryoniae* O. with a plate of four figures and a map, and O. Tiedemann records a European occurrence of *Vitula serratilella* Ragonot, a North American Pyralid, with two plates showing the insect and near species, with genitalia preparations of both sexes. Dr. Amsel shows *Catabrachmia rozsikella* Rebel 1909 to be a synonym of *Xystophora palustrella* Doug. 1850 (Lep. Gelechiidae). The 1959 parts have a record of *Nepticula promissa* Stgr. as an addition to the Austrian list with a figure of the mine; H. Foltin contributes an illustrated article on the Kalkalpen biotope in upper Austria, and G. Warnecke writes on boreoalpine Lepidoptera with distributional maps. Part 3 starts with an account of microlepidoptera from Lower Austria and the Neusirdler lake by Hans Reisser with a long list of species noted with dates. Joseph Wolfsberger describes a new sub-species of *Gnophos intermedia* Wehrli with a plate showing upper and under sides of the holotype ♂ and allotype ♀. Dr. Franz Burgermeister writes on *Colias myrmidone* Esp. and its biotope with three nostalgic photographs of tracts of mountain country, and Victor Richter discusses bitten-off butterfly wings.

Obituary

In our last issue we announced briefly the death of a good supporter of the *Record*, Dr. G. V. BULL, of White Gables, Sandhurst, Kent, who died on 2nd March 1959 in his 87th year. He had been a member of the 'South London' since 1927 and had often contributed Notes to this journal. By the courtesy of the *British Medical Journal* we are able to print the following, more extended, notice of him.

George Vernon Bull was the son of William Bull, one time Senior Master at Harrow School, where he was educated. From Caius College, Cambridge, where he was Sayer scholar, he went to St. Bartholomew's Hospital, winning the Jeaffreson exhibition. He qualified by taking the London Conjoint diploma in 1899, and two years later obtained the degrees of M.B., B.Chir. After qualification he held the appointments of house-physician at St. Bartholomew's Hospital and house-physician and house-surgeon at the Hospital for Sick Children, Great Ormond Street. Afterwards his life was spent in rural practice at Ashbourne, in Derbyshire; Hoddesdon, in Hertfordshire; and for the last 30 years, partly in retirement, at Sandhurst.

C. G. L. writes: By the death of Dr. G. V. Bull medicine has lost a well-loved country doctor and entomology a lifelong lepidopterist. Sometimes his patients would catch glimpses of him performing strange rites with a sheet under willows on dark nights in March, or by his car, headlights blazing, in the ride of some wood, waiting net in hand, or, tall and statuesque, by some spray of honeysuckle at dusk on a June evening, alert for the blurred appearance of elephant hawk-moths. Strange creatures in matchboxes and cigarette tins would be left at the surgery for identification. He belonged to a long and broad line of naturalist-doctors, men like John Hunter and William Jenner, who got an abiding content from branches of natural history other than medicine. The contagion of their keenness infects others: I can recall at will a near view of the pearly eggs of a poplar hawk-moth on the underside of a leaf which "Verney" Bull gave me as a child of 7 over sixty years ago. He married in 1915 Edith May Newsam, to whom we offer our sincere sympathy.

Editorial Note

We greatly regret that owing to illness, our Manager has been advised by his doctor to give up the management of this magazine, at any rate for the present. In consequence of this, the production of the present number has devolved on the Editor, albeit under instruction from the Manager, but we ask the indulgence of our readers for any technical shortcomings in the production which may have resulted from this change from our Manager's experienced handling of the matter.

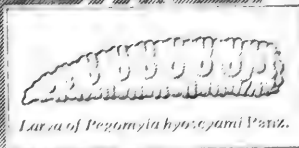
Until other arrangements are made, the Editor will continue to produce the magazine, and we are sure that readers will join us in thanking Mr. Allan for his past great services to the *Record*, and in wishing him a speedy recovery from his present indisposition. We may add that, although it is not our intention to worry him unduly, we hope still to be able to draw on his long experience during the transition period until the question of the future management of the magazine has been settled.

Request for help in breeding *Lasiocampa quercus*, the Oak Eggar, and its two dark forms, *olivacea* and *lurida*

I am expecting during June and July this year to obtain pairings of the Oak Eggar and its dark forms. There is evidence that a proportion of dark caterpillars produce dark moths (of both forms). Would anyone with experience who is willing to undertake the breeding of small numbers of these, and who has the amenities for doing so, be so good as to help if I send the ova. My requirements are that the numbers of the two larval forms should be recorded and the number of dark and normal moths which hatch from them. This necessitates keeping the dark and brown larvae separate.

Anyone who helps can retain their specimens, but I would be grateful to receive a couple from each brood for reference purposes.

DR. H. B. D. KETTLEWELL,
Genetics Laboratory, Department of Zoology,
University Museum, Oxford.



Larva of *Pegomya hyoscyami* Panz.

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Insects

THE ENTOMOLOGIST'S RECORD

AND JOURNAL OF VARIATION

Edited by S. N. A. JACOBS, F.R.E.S.

with the assistance of

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A Mass Movement of an African Ladybird Beetle

Epilachna canina Muls.

By J. SNEYD TAYLOR

In his recent (1958) *Insect Migration*, Dr. C. B. Williams includes an account of the migrations and mass movements of various species of ladybird beetles (Coccinellidae), and mentions that about half-a-dozen of the 40 British species are known to make such movements. He also states that "the long-distance movements of these beetles appear to be journeys to and from hibernating quarters (which are frequently on high ground)". The case of an American species, the Convergent Ladybird *Hippodamia convergens* Guér., is quoted. In California this ladybird feeds on aphids during the summer in the coastal areas, but in autumn, and sometimes earlier, it moves towards the hills and collects in masses at an altitude of some 5000 feet, clustering under stones, dead leaves and the like. One cluster may contain several thousand beetles. Here they remain for the winter, returning to the coastal areas, a distance of about 100 miles, in the spring.

On reading this interesting account, I recalled having seen in the local insect accessions book an entry concerning a ladybird collected on Cockscomb (5772 feet), the highest peak in the Great Winterhoek range and some 60 miles N.W. of Port Elizabeth. It may be added here that Cockscomb is much the highest peak anywhere near Port Elizabeth, and is a landmark for many miles, not only from the coast but from far inland as well. It derives its name from the resemblance of its outline to a cock's comb.

Apart from the date of collection—September 1950—the locality and the collector's name, no other data were given. Reference to the actual specimens revealed that they belonged to *Epilachna canina* Muls., and this has subsequently been confirmed by the Commonwealth Institute of Entomology. I immediately wrote to the collector, Dr. (Mrs.) E. E. A. Gledhill (then Dr. Archibald), a well-known botanist and plant ecologist, asking for details. She very kindly responded and has given me full particulars of the occurrence. From these it is quite evident that it is an instance of mass movement to high ground for the purpose of hibernation. As it appears to be the first case of its kind reported in Africa, it seems worthy of record.

Dr. Gledhill reports as follows on her discovery which took place on or about 24th September 1950. "The ladybirds were found under slabs of Witteberg quartzite just around the beacon on the highest 'comb' or point of the mountain. While looking round quickly, four or five colonies up to about a foot in diameter were seen, as well as smaller clusters of two or three inches. The large ones must have consisted of a good many individuals as they were crowded together, sometimes two or three deep, and without any space to spare. They were not active, in spite of it being very hot at the time (about 11 a.m.) after a cold night. The vegetation on the top of the mountain was mainly Restionaceae, with some Proteas, and also lichens, on the rocks".

Epilachna canina Muls. (also its aberration *dregei* Muls.) is popularly known as the Potato Ladybird Beetle, and is widespread in the Union and the Rhodesias. Both adults and larvae feed on the foliage

of potato and many other cultivated plants including tomato, pumpkin, marrow, cucumber, melon, turnip, radish, bean and spinach. It also occurs on various indigenous species of Solanaceae and was recently found on *Leonotis dubia* E. Mey. (Labiatae).

Although recorded by Gunn (1916) as causing serious damage to potato plants in the Transvaal, the status of this Coccinellid in the Eastern Cape Province would appear to be no more than that of a minor pest. Gunn gives details of the life-history and mentions that the adults hibernate during winter and early spring under the bark of Eucalyptus trees, stones and rubbish near gardens and potato fields. He also states that the adults are slow in their movements and are poor fliers.

Potatoes, tomatoes and other vegetables are extensively grown along the coastal belt westwards from Port Elizabeth, and in the Gamtoos river valley. The latter is considerably nearer Cockscomb, and one of the main tributaries of the Gamtoos passes through the Winterhoek range in an immense gorge on the western side of the peak. On the other (inland) side of the mountains the Great Karoo stretches for many miles, and the country and vegetation are very different.

In a recent letter, Dr. C. B. Williams informs me that in the United States of America a species of *Epilachna* is known to move to hibernating quarters but does not usually travel far.

ACKNOWLEDGMENTS

I am much indebted to Dr. E. E. A. Gledhill for so kindly supplying the data concerning her important discovery, as well as for permission to use it. Thanks are also due to Dr. C. B. Williams for additional data; to the Commonwealth Institute of Entomology for the determination of *Epilachna* material; and to Miss G. V. Britten for plant identifications.

REFERENCES.

- Gunn, D. 1916. "The Potato Ladybird Beetle *Epilachna dregei*". *Div. Ent. Dept. Agric. Bull.* 6, Pretoria.
Williams, C. B. 1958. *Insect Migration*. Collins, London.
Box 7011, Port Elizabeth. 15.iv.1959.

Variations of *Aglais urticae* L.

By Major Gen. C. G. LIPSCOMB.

In the December 1956 number of the *Record*, Lempke, in an article entitled "On some forms of *Aglais urticae* L." discussed at length the correct names for most of the major varieties of this butterfly. In the fourth supplement to his Catalogue of the Dutch Macrolepidoptera, extracts from which are here translated, he takes the story further and lists what, in his opinion, is the proper naming of the butterfly's many minor varieties and colour forms, so far as they are known from the Netherlands.

He points out that Raynor made a detailed analysis of the variability of this species in 1909 (*Ent. Rec.*, 21: 4-8) and that four years later Fritsch, in ignorance of Raynor's article, again described a number of colour types (c.f. *Farbenspiele von Vanessa urticae* L. *Ent. Rundschau*, 30: 8-9). Because of the briefness of Raynor's descriptions, it is practically impossible to decide which of his forms are identical with those of Fritsch, whose descriptions, in Lempke's opinion, are much better. He

goes on to say that he, therefore, prefers the names given by the latter unless there cannot be any doubt about the identity of forms described by both authors.

The absence of any records of the whereabouts of the original colour types if they exist, which is doubtful, is an additional complicating factor.

Dr. Lempke has very kindly read through the translation and has made constructive suggestions, and we thank him very much, both for his valuable help and for permission to publish this translation of his paper.

A Teratological.

- f. *urticoides* Fischer de Waldheim 1851, *Entom. Russie*, **5**: 123.
Undersized specimens, not common.

B. Colour forms, upperside.

- f. *brunneo-violacea* Raynor, 1909 (*loc. cit.* p. 7) (*guhni* Tschauer 1926, *Int. Ent. Guben*, **20**: 230; *implumis* Watkins, 1942, *Entomologist*, **75**: 202). Ground colour brownish with a mauve glow resulting from abnormal scaling—see Frohawk, *Nat. Hist. Brit. Butt.*, **1**: pl. 25, fig. 17.
- f. *igneiformis* Reuss, 1910. *Entomologist*, **43**: 343 (*fervida* Fritsch, 1913, *Ent. Rundschau*, **30**: 9). The ground colour is strikingly redder than in normal specimens, and the yellow is also mostly of a deeper tint. Rare.
- f. *sordida* Fritsch, 1913 (*Ent. Rundschau*, **30**: 9). Ground colour duller and therefore more yellowish brown, the yellow markings darker thereby contrasting less with the basic colour.
- f. *lucida* Fritsch, 1913, *Ent. Rundschau*, **30**: 9. Ground colour lighter, less red, the yellow markings being in marked contrast—the lighter parts of the underside are noticeably paler—apart from specimens wholly answering the description of Fritsch, there are also some of which the basic colour of the upperside agrees with that of *lucida* but of which the undersides are typical. These insects can be regarded as intermediate stages towards *lucida*.
- f. *salmonicolor* Raynor, 1906, *Ent. Rec.*, **18**: 298 (*rosaca* Closs, 1916, *int. ent. Z. Guben*, **9**: 115) ground colour pink.
- f. *alba* Raynor, 1909, *Ent. Rec.*, **21**: 7 (*pallida* Frohawk, 1938, *Vars. Brit. Butt.*, 91). Ground colour white. Very rare.
- f. *flavotessellata* Raynor, 1909, *Ent. Rec.*, **21**: 7 (*elisa* Stephan, 1923, *Iris*, **37**: 37). On the forewings a yellow band runs from the outermost yellow costal patch to the inner edge of the wing—both the black discal spots are within the band. Not a rare form.
- f. *albidomaculata* Stach, 1922, *Spraw. Kom. Fiz.*, **55-56**: 132. All markings which are normally yellow are changed to white. An extremely dangerous form to cite, because the yellow colour is apt to fade rather quickly under the influence of light. The name should only be used for bred specimens so as to exclude all doubt.
- f. *erythrophaea* Fritsch, 1913, *Ent. Rundschau*, **30**: 9 (*extrema* Schoenfelder, 1925, *Ent. Z. Frankfurt*, **39**: 143). The yellow markings on the fore and hind wings have vanished completely—all other markings are normal.

- f. *caerulapicata* Raynor, 1906, *Ent. Rec.* **18**: 298. The apex of the forewings is dusted with light blue scales—it would appear best to use this name also for specimens in which the white spot near the apex is tinted blue. Rare.
- f. *violescens* Slevogt, 1900, *Horae Soc. Ent. Ross.*, **34**: 530. The crescents on the outer edge of the wings are not blue but (when held in a slanting position) violet. Uncommon.
- f. *luteomarginata* Lambillion, 1906, *Rev. Soc. ent. Namur.*, **6**: 47 (*fulvomarginata* Raynor, 1909, *Ent. Rec.*, **21**: 7). The outer edge of the wings is clearly coloured yellow. Not rare.
- f. *griseomarginata* Raynor, 1909, *Ent. Rec.*, **21**: 7. The outer edge of the wings is clearly coloured grey. Seems to be much rarer than f. *luteomarginata*.
- f. *adumbrata* Raynor, 1909, *Ent. Rec.*, **21**: 7. The yellow marking on the front edge of the hind wing is either completely or virtually overcast by a black shadow
- f. *infusata* Raynor, 1909, *Ent. Rec.*, **21**: 7. All the black markings on the forewings are of a deeper tint and heavier, especially at the base of the wings near the rear edge, giving the specimen a somewhat sombre appearance.
- C. Colour forms (underside).
- f. *subtus-ochrea-balteata* Reuss, 1910, *Entomologist*, **43**: 279. The submarginal band on the hindwing is yellowish or nearly white. Rather rare.
- f. *subtus-niger* Reuss, 1910, *Entomologist*, **43**: 279. The dark markings are not brownish black, but deep black. Not common.
- f. *subtus-nigrescens* nov. The hindwings are almost entirely unicolorous blackish.
- D. Markings on the upperside of the forewings.
- f. *basi-ichnusa* Reuss, 1910, *Ent.*, **43**: 280. The base of the wing is dusted with dark scales up to the first costal black spot, and to the black spot on the inner edge. According to Reuss this is caused by the retarded development of the caterpillar or chrysalis or by inadequate nourishment. A very rare form.
- f. *nubilata* Raynor, 1909, *Ent. Rec.*, **21**: 7. A dust of black scales runs from the second costal spot to the black spot on the inner edge, right across the wing (cf. South, pl. 38, fig. 4). This form is often referred to as *polaris* Stgr., a sub-species from northern Scandinavia or as *semi-polaris* Birch, 1944, *Ent.*, **77**: 8, or *pseudo-polaris* Rowley, 1939, *Ent.*, **72**: 292. Fairly common.
- f. *fasciata* Maslowsey, 1923, *Polskie Pismo Ent.*, **2**: 126, fig. 2 (*pseudo-connexa* Cabeau, 1927, *Lambillionia*, **27**: 90). A more extreme version of the previous form, the black scaling having become so dense as to form an almost solid band. Much rarer. Pictured in *Lambillionia*, **29**: pl. 1, fig. 3.
- f. *elongata* Birch, 1944, *Entomologist*, **77**: 7. One or both black discal spots elongated.
- f. *magnipuncta* Raynor, 1909, *Ent. Rec.*, **21**: 8. With discal spots clearly enlarged. Not common.

- f. *parvipuncta* Raynor, 1909, *Ent. Rec.*, **21**: 8. With small discal spots ranging from clearly reduced but easily visible spots to very little dots. Extreme form rather rare.
 - f. *tripuncta* Raynor, 1909, *Ent. Rec.*, **21**: 8. Three discal spots—the additional spot can be located above as well as below the normal ones and is as a rule smaller than these. A rare form.
 - f. *unipuncta* Raynor, 1909, *Ent. Rec.*, **21**: 8. Only one discal spot. Rather rare.
 - f. *impuncta* Lempke, 1931, *Lambillionea*, **31**: 98. Both discal spots missing, otherwise normal. Rare.
 - f. *radiata* Raynor, 1909, *Ent. Rec.*, **21**: 7. The veins in the red-dish central section are black. Not very common.
 - f. *costajuncta* nov. The first and second costal spots on the upper side of the forewings are connected by a thick black bar along the costa, all other markings normal.
 - f. *magninotata* Raynor, 1909, *Ent. Rec.*, **21**: 8. The black spot on the rear edge of the wing is noticeably enlarged. Not common.
 - f. *parvinotata* Raynor, 1909, *Ent. Rec.*, **21**: 8. The black spot on the rear edge of the wing is noticeably reduced. Rather common.
 - f. *parviguttata* Raynor, 1909, *Ent. Rec.*, **21**: 7. The blue lunules on the outer border are reduced in size—specimens in which these spots are so reduced as to be hardly visible, or which lack some of them altogether, are not rare.
 - f. *magniguttata* Raynor, 1909, *Ent. Rec.*, **21**: 7. The blue lunules on the outer border are clearly enlarged. A very rare form.
 - f. *leodiensis* Cabeau, 1933, *Lambillionea*, **33**: 77. The two outermost costal spots have merged, the two discal spots are either missing altogether or are very small; the yellow markings are lacking and so are the blue lunules on the outer border; the hindwings are normal, so that only the forewings show the *ichnusioides* markings.
- E. Markings on the upper side of the hindwings.
- f. *angustibalteata* Raynor, 1909, *Ent. Rec.*, **21**: 8. The red submarginal band is noticeably narrow—otherwise normal. Rare.
 - f. *latibalteata* Raynor, 1909, *Ent. Rec.*, **21**: 8. The red submarginal band is noticeably wider than normal. Rare.
 - f. *magnilunulata* Raynor, 1909, *Ent. Rec.*, **21**: 8. The blue lunules noticeably enlarged. Uncommon.
 - f. *parvilunulata* Raynor, 1909, *Ent. Rec.*, **21**: 8. The blue lunules are much reduced in size. Not common.
 - f. *luna* Reuss, 1909, *Ent. Rec.*, **21**: 211. The third and fourth lunules counted from the front edge of the wing are merged into one large blue spot.
- F. Markings on the upperside of the fore and hind wings.
- f. *nigrimarginata* nov. Fore and hind wings with broad black outer border, all other markings more or less typical.

Spring Butterflies round Lake Garda (North Italy)

By R. F. BRETHERTON, C.B., M.A., F.R.E.S.

During a holiday in North Italy some of my family and I spent four days, 4th to 7th April, 1959, at Torri del Benaco on the shores of Lake Garda. Collecting was not our main object, but we gave some attention to the local butterflies. As the area does not seem to be known to many British collectors, a record of our experiences may be worth while, even though we found no particular rarities. In all we noted twenty-nine species of butterflies, which seems quite a respectable total for so early a date. We were told that spring had come rather earlier than usual there, as in England. Even so, apart from the hibernators, most of the species we saw were only just beginning to emerge, being in small numbers and mostly males: had we stayed a few days longer our total both of species and of individuals would certainly have been very much larger. Moreover, we spent most of our time on the east side of the lake, which gets less sunshine and is more exposed to wind than the western shore. A visit to Gardone Riviera, opposite, on our last afternoon, yielded several species which we had not seen before and showed that the season was more advanced on that side.

On both sides the ordinary "swallow tails" were in evidence and fairly numerous, though difficult to catch—*Iphiclides podalirius* L. mainly among cherry trees in gardens, *Papilio machaon* L. sweeping among the olive groves and settling on sunny banks by the lake. The "whites" were the most conspicuous group. *Leptidia sinapis* L. was fully out: there were large colonies among scrub and bushes and stray individuals almost everywhere. *Pieris napi* L. was almost as common, but *P. brassicae* L. was rather scarce, and *P. rapae* L. was exceeded in numbers by its non-British relative *P. manni* Mayer: the examples of this which we took were variable in the extent and shape of the black markings, and some are difficult to separate with certainty from *P. rapae*. Most authors say that *P. manni* prefers bare hillsides and is not found, like *P. rapae*, on cultivated ground, but this was certainly not true round Garda. Unfortunately we did not find the other non-British species, *P. ergane* G.-H., though it ought to occur on the limestone of the Monte Baldo. There were a few *Anthocharis cardamines* L., as yet only males. *Colias crocea* Fourc. was fairly common, and in a gully above Gardone we took a magnificent fresh female of *f. helice* Hubn., flying along with several *C. australis* Verity. Hibernated *Gonepteryx rhamni* L. were everywhere, in both sexes and remarkably good condition.

Hibernated Vanessids were also plentiful. A single, very faded, *Vanessa atalanta* was seen. *Nymphalis io* L. and *N. antiopa* L. were flying far up the wooded slopes of Monte Baldo, the latter with faded fringes but otherwise mostly in good shape; and we saw *Aglais urticae* L. egg-laying on dead nettle stems above the snow at nearly 6,000 feet. *Polygonia c-album* L. was rather scarce, but we saw several of its relative *P. egea* Cramer. This is a larger, brighter, and less ragged insect, which looks rather like the summer form, *hutchinsoni* Robson, of *P. c-album*. We saw at least a dozen of them flying round sunny walls above the ruins of the Roman theatre in the city of Verona.

Unfortunately I had left my net in my suitcase at the station; but we were able to secure one fine specimen with the help of a transparent plastic sandwich box! This was the only species completely new to me which was obtained during this holiday. A larva of *Aporia crataegi* L., which soon pupated, was found in the same place.

One species of Fritillary, *Brenthis dia* L., was emerging in numbers on a south-facing hillside above Garda. Of the "browns", *Pararge megera* L. seemed to have been out some time, but *P. egeria* L., in its lovely typical form in which the spots are rich brown, was only just beginning, thus reversing the order of appearance of these species to which we are accustomed in England. It is known that the early examples of *P. egeria* in England have hibernated in the pupal stage and not, as is usual, as larvae: perhaps the relatively later emergence at Garda may be due to the absence of pupal hibernation there. *Coenonympha pamphilus* L. was also only just beginning to emerge.

Of the Lycaenidae, *Callophrys rubi* L. was locally abundant in open scrub: the butterflies sat by preference on small juniper bushes, where, with closed wings, they were excellently camouflaged. *Lycenopsis argiolus* L. was not numerous. We caught two early examples of *Cupido minimus* Fuessly, and at Gardone *Polyommatus icarus* Rott. was just beginning. The most interesting "blue" was *Philotes baton* Bergstr., of which we discovered a large colony on a Cistus-covered bank near Garda, as well as isolated examples elsewhere. They varied a good deal both in size and in the brightness of the red markings underside.

Three "skippers" were seen—a single *Carcharodus alceae* Esp., and small numbers of *Erynnis tages* L. and of *Pyrgus malvoides* Elwes and Edwards. Lake Garda is not very far from the "frontier", which appears to separate sharply the territory of the latter from that of *P. malvae* L.; but my specimens clearly belong to *P. malvoides*.

No collecting was done at night, but a few day-flying moths were noted. *Macroglossa stellatarum* L. was widespread, but worn and probably hibernated. *Ematurga atomaria* L. was common in meadows, in a handsome, large, bright form, and on the same ground were great numbers of *Pyrausta cespitalis* Schiff. *Pseudopanthera macularia* was flying freely at Gardone, and a single specimen of what appears to be *Ortholitha umbrifera* Prout was taken at Albisano.

The Garda district, and particularly the limestone massif of Monte Baldo, would evidently give most interesting collecting rather later in the season, and I shall certainly try to return to our comfortable quarters in Signor Tomei's "Albergo Gardesana" at Torri del Benaco in some future year.

Ottershaw, Surrey. 18.iv.1959.

A Note on certain apple-feeding Microlepidoptera at Blackheath

By A. A. ALLEN, B.Sc.

I was glad that Mr. H. C. Huggins, in the course of his interesting *Notes on Microlepidoptera*, brought up the question of *Pammene*

argyrana Hübn. as an occasional apple-feeder (*antea*: 51), for I had been somewhat puzzled earlier at finding this normally oak-feeding Tortrix associated with apple trees in my garden each season since I began to pay attention to the group five years ago. In spite of Barrett's statement that in some districts the moth is found in plenty on the trunks of apple trees, this deviation from the recognized habit seems not to be generally known and confirmation by recent observers to be almost lacking—to judge from the fact that, for example, Ford (*A Guide to the Smaller British Lepidoptera*, 1949) does not mention it. Be that as it may, there can be no doubt about the apple-feeding habit of the species here; though whether some of the few isolated oaks in gardens (none of them close by) also harbour it, I cannot say. The moths mostly affect a group of six trees planted about 30 years ago and vary considerably in numbers in different years—exceptionally as many as four have been noted at a time on one trunk, in April or May. At the same time pupa-cases are to be seen sticking out of chinks in the bark, but though I have bred out a number of 'micros' from the leaves and shoots of these apple trees I have not so far reared this species, nor identified its larva. None of the Blackheath *argyrana* I have seen are of the peculiar dark form described by Mr. Huggins from his specimen from the Bredgar (Kent) orchard, and do not appear to differ in any obvious way from the ordinary oak-feeding form of the insect.

It strikes me as very curious that a species whose normal larval pabulum consists of oak-galls (*not* the leaves) should in certain places select instead a diet of apple leaves. If the moth is indeed a 'composite species'—as to that, is it known whether larvae from one host will feed on the other or not?—the oddity becomes more understandable; yet not wholly, for in other instances of composite species (at least those known to me) the members of a complex feed on related plants, usually within one family. The 'biological races' of *Hyponomeuta padellus* L. on various Rosaceae are a case in point. However, examples of insects varying in host-choice between apple and one of the Fagales (equivalent to the older Amentaceae or Cupuliferae), besides *P. argyrana*, are not entirely wanting.

Three further such species occur on the same apple trees in my garden. *Argyresthia andereggiella* Dup., which appears here very sparingly when the hordes of *A. cornella* F. are well on the decline, is stated to feed as a larva in shoots of hazel in addition to those of apple. The Gelechiid *Parachronistis albiceps* Zell., reputedly a hazel-feeder only, turned up here last July for the first time—two on apple trunks and one on a nearby fence—there being no hazel in the garden nor, I am almost sure, in the adjoining ones. Since it cannot yet be proved that they originated from the apple trees I hesitate to record the latter definitely as an alternative host, nevertheless I have little doubt that such is in fact the case and that we have here an exact parallel with *A. andereggiella*. The third example is from the Coleoptera: the weevil *Magdalis cerasi* L. is found on apple (also supposedly on other Rosaceae, but not so far by me) and—in my experience far more often—on oak, but not other trees. A similar host-dualism, if I may so call it, appears to exist in some foreign species of the same genus. There would seem to be no close natural affinity between the two botanical orders concerned, but this does not, of course, exclude the possibility that certain members of both share some one or more chemical attractants.

In passing, it may be added that the recently detected Tortrix *Adoxophyes orana* F.R. has arrived in this district, but has shown no sign yet of becoming a serious pest. Two specimens occurred in the garden about apple trees and another on the edge of Blackheath Village facing the open heath, no fruit trees being near—all in 1956. I believe that the previous nearest capture to London was at Bromley (four miles south of here) by our Editor, Mr. S. N. A. Jacobs, who obligingly confirmed the species for me.

Notes on the Microlepidoptera

By H. C. HUGGINS, F.R.E.S.

PAMMENE ARGYRANA Hub.: In the February "Record" (71: 51) I discussed the late apple frequenting insect which has been referred to this species, and mentioned that I had one and that Mr. J. D. Bradley had shown me a similar specimen in the Doubleday collection. Of course, the provenance of this latter insect is unknown, but it exactly agreed with my black insect taken in an apple orchard near Bredgar. Mr. Bradley and Dr. N. S. Obratzov of New York gave my insect a careful overhaul and have pronounced it to be *P. albuginana* Guen. = *gallicolana* Zell. (I suppose I must use these accurst names, so I am keeping Mr. Bradley's list on my writing table. Should it become lost I fear the dog will return to his vomit). When it returned (minus the genitalia which are being retained as a museum preparation) I compared it with my bred series of *albuginana* and found it corresponded in all respects except colour. The dorsal blotch and costal ticks are identical, also the size and wing shape, but whereas my bred ones are dark brown with golden reflections, this insect is blackish. I think there can be no doubt it is now correctly placed, but its identity brings us no nearer to the solution as to why it feeds on apple leaves, and the oak feeder only on galls. This identification also explains the date, the end of May, which is just right for *albuginana*, which I have seen flying at Ham Street in early June, but much too late for *argyrana*.

SCHOENOBIVS DOTATELLUS Walker: The death of my old friend Mr. H. M. Edelsten, whom I had known since 1901, has recalled the alleged British record of this insect to me, as I do not think everyone saw Mr. Edelsten's contradication of it, so there can be no harm in my repeating it.

In 1924 Edelsten captured an insect in Sussex and saw others, which he could not place. He referred it to the B.M. (N.H. section) and it was there pronounced to be *dotatellus*: with characteristic generosity he presented it to the Museum collection (*Proc. Roy. Ent. Soc.*, 1927: 2: 20).

Some three or four years ago, Mr. E. L. Martin, who was then working on the group, saw this insect and was at once seized with doubts. I happened to be visiting the museum a day or so after and he asked me my opinion, and I saw at once it was a large female *forficellus* Thunb. which although in good condition had managed to wear away the characteristic pointed tips of the wings without otherwise damaging itself, thus superficially changing its appearance. I

should say at once that Mr. Martin had quite made up his mind as to its identity and merely asked my opinion to see how it struck someone else. Mr. Edelsten thereupon published a correction (*Entomologist*, **88**: 1955: 283). No doubt the other insects seen in the light of an ordinary hand lamp were normal *forficellus*, but unfortunately none were brought home.

Notes on *Telphusa triparella* Zell.

By S. WAKELY

Although Meyrick states that this species is "rather common" I have only once taken this moth and that was a single specimen at Brentwood in Essex in 1936. It is ochreous brown in colour with three distinct black double spots (one approximately above the other) roughly equally spaced across the forewings.

According to Stainton, both Haworth and Stephens confused it with *Exoteleia dodecella* L. The latter species has three black double spots arranged similarly to those in *triparella*, but the ground colour is grey with no sign of the ochreous ground colour of *triparella*. The larval habits are very different, too, for the larva of *dodecella* feeds on pine, whereas *triparella* is given by Stainton, Meyrick and L. T. Ford as feeding between joined oak leaves in August and September. The leaves are joined together with short pieces of strong white silk spun to the thickness of a thread, the larva inhabiting a burrow among the excrement.

Last autumn Dr. D. A. B. Macnicol kindly sent me some leaves of *Myrica gale* (bog myrtle) which had been gathered at Pitlochry, Scotland, and which contained spun-up larvae of *Argyroproctea dimidiana* Sodof.—a tortrix I was anxious to breed. Greatly to my surprise, a fine specimen of *Telphusa triparella* emerged from these leaves on the 6th April, followed by two *A. dimidiana* on the 15th.

None of our British authors mention any foodplant other than oak, so I came to the conclusion that the larvae had probably fed up on oak and wandered on to the bog myrtle to pupate. The snag was that the vicinity of bog myrtle seemed the wrong sort of place to find oak growing.

As an afterthought I looked the species up in Spuler's book, and the mystery was solved as he gives "*Quercus* und *Myrica gale*" as foodplants.

Stainton mentions that *triparella* was common in his district at Lewisham in South London, and I understand that L. T. Ford finds the larvae near Bexley, Kent. Meyrick gives as distribution "England to York, S. Ireland (Killarney)", so the Pitlochry specimen adds a much further northward range to the previously known distribution in Britain, together with another unsuspected foodplant. One cannot help thinking that the Killarney specimens were also probably taken among bog myrtle, which is so common thereabouts.

REFERENCES.

- Ford, L. T. *A Guide to the Smaller British Lepidoptera*, 1949, p. 96.
Meyrick, E. *A Revised Handbook of British Lepidoptera*, 1927, pp. 618-619.
Spuler, A. *Die Schmetterlinge Europas*, 1910, Vol. 2, p. 359.
Stainton, H. T. *The Natural History of the Tineina*, 1865, Vol. 9, pp. 184-194.

Another aspect of Inverness-shire in 1958

By P. LE MASURIER

In the March issue we were given a summary by Commander Harper, of the 1958 season, relative to the lepidoptera in Inverness-shire. Having experienced the season myself and also having participated in some of the events described, I naturally read his article with more than usual interest.

The 1958 season was, apart from a few holiday visits, my first in the Highlands and my impressions differed greatly from his. I must emphasise, of course, the difference between our viewpoints. Commander Harper came to live in Newtonmore in 1952 and the novelty of Scottish lepidoptera has begun to disappear. In my case, nearly every specimen was a novelty, either a new species or at least a new form of a familiar species. In my first year in the Highlands I had, of course, no other year with which to make odious comparisons.

Unlike Commander Harper, my activities were confined to Badenoch, mostly in the vicinity of Aviemore, where my m.v. trap was in nightly operation in the garden. Soon after my arrival in Aviemore we were treated to a considerable amount of snow. Before long the temperatures were very low and occasionally sub-zero. I found the climate very pleasant and, due to the dryness of the atmosphere, I was not much inconvenienced by the cold. What little spare time I had, was spent in planning for the start of the entomological season. I could hardly wait for the appearance of *Brachionycha nubeculosa* Esp. I plodded out in the snow in late March and diligently scrutinised the local birches. It appeared in the trap on 2nd April. That was the first of 34 new species in 1958.

Another species anxiously awaited, was *Endromis versicolora* L. which, in spite of sunny days, was not to be found in late April. It eventually appeared locally on 1st May. I later reared over 30 to pupa stage without one single casualty.

Soon two more Highland species were added to the collection, *Anarta cordigera* Thunb. and *Isturgia carbonaria* Clerck. So far I had been well pleased with the season and the pleasures of collecting among such grand scenery were very real.

During the year, I even added two species to my collection that, in olden days, I had not anticipated ever seeing: *Amathes alpicola* Zett. and *Apamea assimilis* Doubl. The season of 1958 continued a memorable one for me. The weather in June and early July was perfect, sunshine every day even without my rose-tinted glasses.

In August, a month of poor weather and plenty of rain, *Rhodometra sacra* L. visited my trap. New species continued to come my way: *Amathes agathina* Dup., *Diarsia dahlia* Hubn., *Aporophyla nigra* Haw. and *Enargia paleacea* Esp.

September and October were very pleasant months, mainly mild and dry. The glorious colours of the leaves in October surprised me, exceeding by far the beauties of autumn in the south of England.

Maybe Commander Harper was most depressed by the 1958 season. I look forward to some wonderful seasons in the future, secure in the knowledge that I have apparently just enjoyed the worst season in the Highlands since 1952. No! my friend, the season now past was not so depressing. It was the best season since 1928, the year I first started with 78 new species.

Alt na Craig, Aviemore, Inverness-shire.

Notes on Coleoptera

By A. A. ALLEN, B.Sc., A.R.C.S.

Polydrusus prasinus Ol. (= *planifrons* Gyll.).—When shall we hear of the rediscovery of this weevil in Britain? It is surely time that it turned up again after a lapse of nearly a hundred years. While it may occasionally have been confused with allied species of its genus or even of *Phyllobius*—and a beginner *might* indeed pass it over amongst some of the bright green-scaled species which can occur in large numbers—I do not think an experienced coleopterist, should he be fortunate enough to meet with it, could fail to recognize it at least as something unusual.

In our fauna it comes nearest to the very common *P. cervinus* L. but is larger, broader, with a thicker and less patchy clothing of scales which is much greener, and a characteristic, very evident, impression between the eyes; the colour of the scales is rich but not shining, about as in *Phyllobius maculicornis* Germ., from which *P. prasinus* is distinguishable at sight by its different build (elytra broader and more convex) as well as by the form of the scrobes, which are very black and conspicuous on the green rostrum.

I know of only two authentic British examples, both in the Power Collection at the British Museum (Natural History): a female labelled 'Llandudno, May 1865, Sidebotham' and a male 'Silverdale, May 66, J. Martin?', both in good condition. With them is an old, once-pinned specimen marked 'B.M. Coll.'—without further data, as usual in such cases—no doubt the one referred to by Walton as in the British Museum (Fowler, 1891, *Col. Brit. Isl.*, 5: 202). Fowler gives a further record, from near Liverpool, but in his supplementary volume (6: 306) it is stated that this was in error.

From its Continental range, which is purely western except in the south, it would be expected to occur in this country; and it is too uncommon to be at all likely to have been accidentally introduced. Moreover, this is improbable with species passing their early stages underground. Casual immigration, with subsequent failure to establish itself, is a possible explanation, in regard to which the fact that the two captures were made within a year of each other may be significant. But equally, and I think more likely, it may be or have been a very rare but genuine native, and, of course, the lack of any recent record is no proof of its extinction. It could be an early species almost over by June (like *P. mollis* Strm.), and may have been missed through extreme localization.

I should like to suggest that any collector working at the beginning of summer in our northern or north-midland hill country, particularly on the western side, from about the latitude of Derby and North Wales to the Lake District, should keep a sharp look-out for this rather handsome insect. Young trees in sheltered woods or copses would appear to offer the best chance; Fowler gives oak, but it is unlikely to be confined to this. Any *Polydrusus* seeming at first glance to be an abnormally large and green *cervinus*, especially if taken within the area indicated, should be subjected to a most critical scrutiny.

Cassida prasina Ill. (= *chloris* Suff.).—This tortoise-beetle, the *C. chloris* of older works such as Fowler but now a namesake of the above *Polydrusus*, appears to be not very much less rare with us; but the three well-authenticated records are more spread out in both space and

time. Again, recent captures seem entirely lacking and the species is due for rediscovery. It was doubtfully British until confirmed by the late Dr. D. Sharp on specimens from Thornhill, Dumfries, about 1870. Next, the Rev. H. S. Gorham took two out of flood-rubbish from the R. Adur at Shipley, near Horsham, in 1882, and another some time later at Twyford, near Winchester. The only other record I have seen is the following, copied from MS notes by the late H. Donisthorpe: '*Cassida chloris*. One at Candleston in May. Attached to *Carduus arvensis* (Glamorgan List)'. The compilation in question is not at hand for reference, and I can find no note of its date; but had any further details been given there, they would no doubt have been transcribed by Donisthorpe. Most probably the captor was J. R. le B. Tomlin, who had collected at Candleston and elsewhere in Glamorgan about the end of last century or the beginning of this, or both.

The oddest feature of these few captures is their wide separation—S. Scotland, S. England, S. Wales. Breeding is proved in two of the four by more than one specimen having been found. Only in the case of the Welsh insect is there any reference to food-plant — and there, 'attached' is a curious word to use where a single example is concerned. Fowler does not mention this either, but Reitter (1912, *Faun. Germ., Kafer*, 4: 218) gives *Achillea millefolium* — this applies to Central Europe. (Habits are often more specialized in these islands where most species are on the perimeter of their range.) *C. prasina* is not rare on the Continent and I conclude it is probably indigenous to Britain, but either excessively sporadic or restricted to a few small areas. It is quite distinct among our Cassidae and can only be likened to *C. sanguinolenta* F. or a small specimen of the common *C. rubiginosa* Müll. with a brownish basal patch to the elytra; but is separable from both by its longer and less rounded form and different and coarser sculpture, and from the second also by its entirely yellow femora.

The Diptera about Dale Fort Field Centre, Pembrokeshire

By L. PARMENTER

(Continued from p. 135)

CASTLE BEACH WOOD

This wood, with beech and sycamore, had bramble, honeysuckle and nettles amongst its lower vegetation. A stream ran through it and there were damp muddy patches along the path. Some patches of flowering hogweed, a few elder bushes, some male ferns and various fungi added further attractions for diptera.

Mycetophilidae were abundant but were not studied. The flies of the marginal woodland included *Pollenia rudis* F. on the nettles, *Rhagio tringaria* L. on leaves of burdock and *Machimus atricapillus* Fln. on sun-lit leaves of the lower herbs and branches of trees. Inside the woodland where the sun broke through, were a few *Syrphus ribesii* L. and *S. albostrigatus* Fln.

The bulk of the diptera were those typical of damp shaded areas.

The species collected or noted were:—

TIPULIDAE

Tipula fulvipennis Deg., *T. scripta* Mg., *T. irrorata* Macq.,
Cylindrotoma distinctissima Mg., *Dolichopeza albipes* Stroem.

PTYCHOPTERIDAE

Ptychoptera lacustris Mg.

STRATIOMYIDAE

Beris geniculata Curtis.

RHAGIONIDAE

Rhagio lineola F., on the bracken fronds, *Chrysopilus cristatus* F.,
C. aureus Mg.

EMPIDIDAE

Hybos femoratus Muell., *H. culciformis* F., *Oedalea stigmatella*
Zett., *Ocydromia glabricula* Fln.

DOLICHOPODIDAE

Dolichopus cilifemoratus Macq. (sensu Collin), *D. plumipes* Scop.,
D. unguatus L., *Hercostomus cretifer* Walk., *H. nigripennis* Fln.,
Hypophyllus obscurellus Fln., *Medeterus impiger* Collin,
Xiphandrium caliginosum Mg., *Achalculus cinereus* Walk., *Argyra*
perplexa Beck., *A. leucocephala* Mg., *Campsicnemus curvipes* Fln.,
Anepsiomyia flaviventris Mg., *Sciopus platypterus* F.

LONCHOPTERIDAE

Lonchoptera lutea Panz. var. *flavicauda* Mg.

PHORIDAE

Aneurina thoracica Mg.

PLATYPEZIDAE

Platypeza furcata Fln.

PIPUNCULIDAE

Chalarus spurius Fln.

SYRPHIDAE

Baccha obscuripennis Mg., *Sphegina clunipes* Fln.

DRYOMYZIDAE

Dryomyza flaveola F., *Neuroctena anilis* Fln.

LONCHAEIDAE

Lonchaea flavidipennis Zett.

SAPROMYZIDAE

Minettia longipennis F., *Peplomyza litura* Mg., *Sapromyza sordida*
Hal., *Lyciella rorida* Fln., *Tricholauxania praeusta* Fln.,
Calliopum aeneum Fln.

PSILIDAE

Psila fimentaria L.

SCIOMYZIDAE

Tetanocera hyalipennis v. Ros.

HELOMYZIDAE

Helomyza variegata Lw.

ANTHOMYZIDAE

Paranthomyza nitida Mg.

EPHYDRIDAE

Parydra coarctata Fln.

SPHAEROCERIDAE

Stratioborborus fimetarius Mg., *Paracollinella fontinalis* Fln.,
Limosina silvatica Mg.

DROSOPHILIDAE

Drosophila melanogaster Mg.

SCATOPHAGIDAE

Scatophaga litorea Fln.

TACHINIDAE

Macquartia praefica Mg.

MUSCIDAE

Muscina assimilis Fln., *Phaonia scutellaris* Fln., *P. variegata* Mg.,
Fannia manicata Mg., *Limniphora exsurda* Pand., *Hebecnema*
fumosa Mg., *H. umbratica* Mg., *Hydrophoria conica* Wied., *Delia*
intersecta Mg.,

HEDGEROWS—Dale Fort to Dale Village

The hedge along Point Wood, especially when lit by sunshine, attracted many flies to the flowers (see list later). On the leaves of the shrubs, etc., were a few species not taken elsewhere and a few of those that were more widely distributed:—

Nephrotoma flavipalpis Mg., *Sciara thomae* L., *Geosargus iridatus* Scop., *G. flavipes* Mg., *Haematopota pluvialis* L., *Empis livida* L., *E. aestiva* Lw., *Borophaga incrassata* Mg., *Chalarus spurius* Fln., *Pipunculus ater* Mg., *Syrphus ribesii* L., *S. balteatus* Deg., *Xylota segnis* L., *Neoscia podagrica* F., *Sicus ferrugineus* L., *Chyliza nova* Collin, *Nemopoda nitidula* Fln., *Ophiomyia maura* Mg., *Phytobia flavifrons* Mg., *Oscinella frit* L., *Thelaira nigripes* F., *Pollenia rudis* F., *Delia intersecta* Mg.

Along the hedgerows close to the village and sea were:—*Tachydromia arrogans* L., *Platypalpus minutus* Mg., *P. extricatus* Collin, *P. pallidiventris* Mg., *Hybos femoratus* Muell., *Dolichopus nubilus* Mg., *Chrysotus gramineus* Fln., *Sciopus wiedemanni* Fln., and *Eristalis aeneus* Scop.

GANN ESTUARY

In the marshy fields, flowered with meadowsweet, iris, marsh thistle and knapweed were several Syrphidae—*Pyrophaena granditarsa* Forst., *Platycheirus manicatus* Mg., *Melanostoma mellinum* L., *Syrphus vitripennis* Mg., *Syritta pipiens* L. and *Eumerus strigatus* Fln. Among other flies noted were:—*Tipula oleracea* L., *Dilophus febrilis* L., *Chloromyia formosa* Scop., *Chrysopilus cristatus* F., *Dolichopus phaeopus* Walker, *Lonchaea flavidipennis* Zett., *Musca autumnalis* Deg., *Drymeia hamata* Fln., *Helina duplicata* Mg., *Hydrophoria conica* Wied., and *Nupedia dissecta* Mg. Galls of the Cecidomyid *Cystiphora sonchi* Lw. were found on the leaves of *Sonchus arvensis* L.

Sitting on *Phragmites* were *Sciara thomae* L., *Dilophus febrilis* L., and *Syritta pipiens* L.

On the grass saltings with the clumps of sea lavender, were flies associated with damp mud, *Dolichopodidae* and *Ephydriidae*, and others associated with the grasses and plants of the coast:—*Aldrovandiella*

coxendia Verr., *Nemotellus notatus* Zett., *Haematopota pluvialis* L., *Dolichopus plumipes* Scop., *D. nubilus* Mg., *Macrodolichopus diadema* Hal., *Machaerium maritimae* Hal., *Argyra grata* Lw., *Platycheirus clypeatus* Mg., *Sphaerophoria rueppelli* Wied., *Cheilosia proxima* Zett., *Eumerus strigatus* Fln., *Lonchae flavidipennis* Zett., *Pherbina coryletti* Scop., *Psilopa leucostoma* Mg., *Drosophila phalerata* Mg., *Chlorops lateralis* Hal., *C. hypostigma* Mg., *Scatophaga litorea* Fln., *Epicampocera succincta* Mg., *Zenillia vulgaris* Fln., *Sarcophaga melanura* Mg., *Morellia aenescens* R.D., *Limnophora marina* Collin, *L. aërea* Fln., *Helina duplicata* Mg., *H. anceps* Zett., *Delia trichodactyla* Rond. and *Caricea trigrina* F.

Fringing the channel of the salt marsh were belts of sea purslane, *Halimione portulacoides* (L.) Aell. Flies were few and mostly those of the mud which had flown on to the vegetation:—*Machaerium maritime* Hal., *Hydrophorus oceanus* Meq., *Syrphus latifasciatus* Meq., *Collinellula fuscipennis* Hal. and its var. *oelandica* Stenh. and *Scatophaga litorea* Fln.

CLIFF TOPS

A search was made for Asilidae amongst the grass on the tops of the cliffs but only *Machimus atricapillus* Fln. was found. Other flies were the abundant *Dilophus febrilis* L. and a few *Chloromyia formosa* Scop., *Rhagio tringaria* L. and *Philophylla heraclei* L. the Trypetid leaf-miner of hogweed. Under an ash tree in an area of scrub patrolled a few *Fannia coracina* Lw. At a small area of ling on the Deer Park headland in warm sunshine, numerous flies were running over the vegetation:—Phoridae—*Aneurina thoracica* Mg., *Diploneura nitidula* Mg., *Phora aterrima* Mg. and *Megaselia dahli* Beck., Sepsidae—*Enicta annulipes* Mg., *Themira leachii* Mg., *Sepsis flavimana* Mg. and *S. cynipsea* L. and the Stratiomyid—*Microchrysa flavicornis* Mg.

LIGHT TRAP

A light trap was working on two nights but few insects were taken. Lepidoptera outnumbered the diptera and the latter consisted of a few *Trichiaspis equina* Fln., *Scatophaga stercoraria* L., *S. litorea* Fln., *Fucellia maritima* Hal., and *Delia trichodactyla* Rond.

WINDOW FLIES

The refectory windows were examined each day. They supplied us with yet a few more species not found elsewhere as well as some of the commoner species:—

Scatopse notata L., *Macrocera stigma* Curtis, *Chorisops tibialis* Mg., *Dolichopus plumipes* Scop., *Lonchoptera lutea* Panz., *Platycheirus manicatus* Mg., *Xylota segnis* L., *Toxoneura muliebris* Harris, *Piophila nigrimana* Mg., *P. varipes* Mg., *Sepsis cynipsea* L., *Nemapoda nitidula* Fln., *Tephrochlamys rufiventris* Mg. var. *canescens* Mg., *Drosophila melanogaster* Mg., *Parascaptomyza disticha* Duda, *Ceratinostoma osteriorum* Hal., *Stomoxys calcitrans* L., *Fannia canicularis* L. and *Caricea trigrina* F.

(To be continued)

Notes and Observations

INDUSTRIAL MELANISM IN GRASSHOPPERS.—I do not know whether Mr. Burton's query regarding the possible spread of industrial melanism to grasshoppers (1959, *Ent. Rec.*, 71: 77) is meant seriously or not, but I think the answer is definitely in the negative.

In East Africa there is almost immediate darkening in the colour of grasshoppers living on areas burnt in grass fires. I would refer to a note of mine published in 1949 (*Entomologist*, 82: 130). Writing from memory, there are, I think, several recorded instances of the development of black pigment in adult Acridians exposed to a dark environment.

The blackish specimens of *C. brunneus* found by Mr. Burton are probably the result of similar darkening in response to a dark environment and are not the result of genetical variation.—D. G. SEVASTOPULO, F.R.E.S., P.O. Box 881, Mombasa.

EARLY VANESSA ATLANTA.—I was surprised to see a very fresh looking *Vanessa atalanta* Linn. in a wood near Lincoln on the 14th April 1959. The time was late afternoon, and the sun was shining in a clear sky. The butterfly behaved in lively fashion, and was very wary. It settled on bare ground for brief intervals, but remained alert all the time. Could it have hibernated, or was it an immigrant? I do not remember having seen the species before the end of May in any previous year, and I would be pleased to know if any other examples were noticed during April this year. *Nymphalis io* Linn. has been fairly plentiful in this area of South Yorkshire this spring, and far more so than during the last three years.

Finally, a female *Heliophobus albicolon* Hb. came to m.v. light in my garden on the 11th May. Surely another early record.—GEORGE E. HYDE, Pantiles, Warrington Drive, Bessacarr, Doncaster. 13.v.59.

FOODPLANTS OF TRICHIURA CRATAEGI L.—I was much interested in the statement (*Ent. Rec.*, 71: 137) that the larvae of this species are associated with particular foodplants in different parts of the country. The same thought has occurred to me with regard to the larvae of *Brachionycha sphinx* Hufn.

I give my own experiences with *T. crataegi* for what they are worth. In east Somerset, where the larva used to be rather common in the Bruton district, I found it more often on hazel than on any other foodplant, but it also occurred on willow, hawthorn, blackthorn, oak, and (once) on maple. I found one larva on birch, outside Crab Wood, near Winchester. When beating blackthorn for larvae of *Thecla betulae* L. and *Strymon pruni* L. outside Hell Coppice near Oxford, I used to obtain a number of larvae of *crataegi*, and they have also been beaten from blackthorn and hawthorn at Badbury Rings, Dorset.—H. SYMES, 52 Lowther Road, Bournemouth. 19.v.59.

ORTHOSIA GRACILIS SCHIFF. IN BOURNEMOUTH.—On 16th April I found a perfect specimen of *O. gracilis* on some palings about three hundred yards from my house. This is the first time I have come across this species in the middle of Bournemouth, nor, for that matter, have I ever seen one anywhere in the day time before. *O. gothica* L. and *O. stabilis*

Schiff. are regular visitors to sallow in my garden.—H. SYMES, 52 Lowther Road, Bournemouth. 20.iv.1959.

BAD NEWS FROM DORSET.—On 13th May, the Rev. F. M. B. Carr and I paid a visit to Hod Hill, one of our favourite hunting grounds. It was a glorious day, and as it had been preceded by a fortnight's fine warm weather, I had hoped to see one or two early specimens of *Euphydryas aurinia* Rott., but on our arrival we found a large number of young bullocks in possession. These active beasts had grazed not only the sides of the hill, but also on the steep slopes of the ramparts at the top except for one limited area which was fenced off. Everywhere else, the grass was cropped so short that it was scarcely any higher than a recreation ground. The ramparts used to be covered with masses of such attractive plants as *Lotus corniculatus* L., *Hippocrepis comosa* L. and *Helianthemum chamaecistus* Mill., which at this time of year should be coming into flower. But there was hardly a sign of any of them, and the leaves of *Scabiosa succisa* L. were stunted and difficult to see. There were cowslips in fair number, but not as many as usual, and a few *Orchis mascula* L. The prospect for such species as *E. aurinia*, *Melanargia galathea* L., *Lysandra coridon* Poda and *L. bellargus* Rott. would appear to be very dim. I suppose one must console one's self with the thought that their larvae have perished in a good cause, helping to make prime beef.

Butterflies were scarce in number, but we saw ten species: *Pieris brassicae* L., *P. rapae* L., *Anthocharis cardamines* L., *Pararge megaera* L., *Coenonympha pamphilus* L. (one), *Aglais urticae* L., *Aricia agestis* Schiff. (one), *Erynnis tages* L. and *Pyrgus malvae* L.

Moths seen were: *Phragmatobia fuliginosa* L. (one, the first I have ever seen on Hod Hill), *Euclidimera mi* Cl., *Ectypa glyphica* L. and *Xanthorhoe spadicearia* Schiff.—H. SYMES, 52 Lowther Road, Bournemouth. 19.v.59.

NIGHT-FLYING DIPTERA.—The winter of 1957-58 was unusually mild, many of the nights being humid and warm, and consequently many species of night-flying Diptera were attracted to the window of my study by the light. Nearly all of them were species of *Trichocera*, but there were also several specimens of *Anisopus fenestralis* (Scop.), various tiny Chironomids, and a few *Trichiaspis similis* Collin (Sphaeroceridae).

Mr. Fonseca informs me that this behaviour by the Sphaerocerids is very unusual, and so I felt it worth recording. Although seen on many a night, sometimes in fair numbers, only the following were actually taken:—Males—9th February, 22nd March; Females—10th January, 13th February, 20th February. Specimens were observed from November 1957 until late March 1958, though only these were caught.

What is more unusual, perhaps, is that during the comparatively cold winter, 1958-9, with cold and windy nights, I have found absolutely no Diptera at night except for the very occasional *Trichocera*.—ADRIAN C. PONT, 16 Woodstock Road, Redland, Bristol 6.

MALE TABANIDAE (DIPTERA).—Most authorities agree that the males of the family Tabanidae are seldom met with, with the possible exception of *Tabanus bromius* L. and *T. autumnalis* L., but even these are not exactly common.

I was somewhat surprised, therefore, to find, whilst identifying some of my 1958 captures, that I had a male *Tabanus bromius* L., and I can recall quite clearly the circumstances in which I caught it. It was 19th July 1958 and I was descending a steep but very dusty and stony foot-path at Cadbury Camp, Tickenham, N. Somerset. The time was about 3.30 or 4 p.m., and it was a blazing hot afternoon. I observed about a dozen *Tabanis* darting around in the sunshine and settling on the path, thus rendering themselves almost invisible. They were quite fearless, or just dazed by the heat: I approached within inches of several and could easily have trodden on them without them flying away. I only took two specimens, both males, one of which is now in my collection. Presumably all the others were also males, otherwise I would probably have been attacked: had I not been a first-year Dipterist and known more about flies, I would have taken more than two.—ADRIAN C. PONT, 16 Woodstock Road, Redland, Bristol, 6.

Current Literature

ALEXANOR (*Revue des Lépidopteristes Français*).—We are delighted to have received Vol. 1, part 1, of this quarterly, which one may consider as a successor to the excellent, but regrettably defunct, *Revue Française de Lépidopterologie*. It is to be published from the Lepidoptera section of the French Natural History Museum, at 45bis, Rue de Buffon, Paris V, under the direction of M. Jean Bourgogne, with a strong panel, including Dr. H. Cleu and MM. G. Bernardi, C. Herbulot, H. Marion, H. Stempffer, H. de Toulgoet, and P. Viette. The opening editorial describes it as being reserved for matter on the palaearctic lepidoptera, being designed for readers who are essentially amateurs, and is, before all, a revue for and by amateurs. The number opens with an account of *Papilio alexanor* Esp. in France by M. Bernardi followed by an account of *Odezia atrata* L. by M. Herbulot, with a bibliography of 18 works quoted. The revision of the Pyraustidae of France by H. Marion is continued from the *Revue Française de Lépidopterologie*, and is preceded by a note giving references to the previous instalments. The present part deals with the genus *Scoparia* Haw. and includes 30 half-tone illustrations of French Pyraustidae. This paper has the excellent idea of double pagination, the number in the collected work being in brackets at the foot of the page. There follows an article on *Parnassius phoebus gazeli* Praviel by G. Bernardi, and a record of *Heodes virgaureae* in the French Ardennes by Rémi Durand. Jean Bourgogne concludes with some remarks on the cyanide bottle. The annual subscription is 2400 francs to those living outside France, a little expensive, but we feel sure that there are many here who will find much in it to interest them. We wish this new venture the success it deserves.—S. N. A. J.

LAMBILLIONE.—In the February issue, Mr. Janmouille records a poor male *Borkhausenia formosella* F. from material taken 14.vii.1955 at Sclessin by H. V. Vignoul as new to the Belgian list and removes *Cacoecia (Tortrix) neglectana* from the Belgian list on the ground of misidentification. Paul Marechal gives a detailed meteorological survey of 1958, month by month, and H. de Lesse contributes a paper on the

Agrodiactus species *phyllis* Christ and *posthumus* Christ from Asia Minor with a map and 8 half-tone photographs of the species with *A. phyllis*, *varnensis* de Lesse for comparison. Dr. P. Houyez writes on the use of coloured paraffin wax in the preservation of glabrous larvae with a reasoned account of the *pros* and *cons*. C. Crosson de Cormier writes on the possibility of the extermination of *Colias palaeno* L. in its haunts in the Hautes Fagnes. The number is concluded by another instalment of L. Scarlet's work on the eggs of Belgian lepidoptera.—S. N. A. J.

AN ILLUSTRATED LIST OF BRITISH TORTRICIDAE, PT. II: OLETHREUTINAE, by J. D. Bradley, completes the revision of the Tortricidae, and it is to be hoped that this work will receive the welcome necessary to justify the author in embarking on the Phalonidae and so bringing the classification of the British Tortricina up to date. This part occupies the whole of Vol. 10, No. 2, of the *Entomologist's Gazette* and consists of 22 pages of text plus 19 plates of 12 figures each, figuring all the species, and some alternative forms of some of them. There are notes, in the style of Meyrick's *Revised Handbook* of seven species added to the British list since the publication of that work, and illustrations of the male and female genitalia of 12 species not figured by Pierce & Metcalfe in their *Genitalia* of the Tortricidae. There is a systematic list of genera and species and an index to species. The classification and nomenclature are altered to comply with the most recent ideas on the subject, and while these may shock some of us, they do represent a forward step with this difficult superfamily. The part is obtainable at 12/6 post free from the *Ent. Gazette*, and together with part I (6/6) the two parts are supplied at 18/9 post free.—S. N. A. J.

THE DISTRIBUTION AND HABITS OF THE BRITISH CONOPIDAE (DIPT.), by K. G. V. Smith. *Trans. Soc. Brit. Ent.*, **13**, pt. 7, 113-136; 10/6 post free from Publications Sec., Dept. of Entomology, The Museum, Manchester, 13.

In 1952, this author published "The Irish Conopidae (Diptera) (with Key to British Species)" in *Proc. R. Irish Acad. (B.)*, **54**: 203-8. The reprints, sixpence, are available from Mr. Smith at the Hope Dept., University Museum, Oxford. As the key became known, more attention was paid to this family of flies and as a result Mr. Smith has produced a useful paper dealing with the distribution of each species and their habits.

Vice county distribution maps are printed 2 to a page. As the names of the vice counties and often actual localities are mentioned, one would have preferred smaller maps, 4 to a page, printed facing each other so that the range of 8 species could have been compared. The species appear to have an erratic distribution, reflecting the gaps in our knowledge rather than the absence of the species in many cases. The maps should stimulate more interest. Beginners wishing to see named specimens will find the noting of Museum collections useful. Date of flight are given, range abroad, flowers visited, hosts named and captors mentioned. A selected list of 67 references completes the paper. It needs a slight correction as items 1926-1945 should be credited to W. J. Fordham and not to E. C. M. Fonseca.—L. P.

THE TRANSACTIONS OF THE ROYAL ENTOMOLOGICAL SOCIETY, LONDON, Vol. 110, Part 15, consists of *The external morphology of some of the dipterous larvae living in the Gramineae of Britain*, by I. W. B. Nye, with 109 figures. It contains a key to the 3rd instar larvae of 41 species of 7 families—Pallopteridae, Anthomyzidae, Opomyzidae, Ephydriidae, Chloropidae, Cordiluridae and Muscidae. Methods of collecting and studying the larvae are explained and there are descriptions and illustrations of the terms used. Figures of the facial mask, cephalopharyngeal skeleton, anterior and posterior spiracles of each species and often of the whole larva are given. All are from the same viewpoint and are thus comparable. Besides describing the 3rd instar larva, some notes are given on 1st and 2nd instars. Life history details are mentioned and the host grasses are listed.

The references to other literature are extremely helpful, for in addition to the usual list at the end of the paper, detailed references are mentioned under each species. The author has been assisted by Mr. J. E. Collin and there are therefore several important pronouncements on synonyms and on earlier mis-identifications of adult flies. There is honest documentation of the variation within the species. Types are generally unique and descriptions of a species need to cover the variation known to the describer.

It is good to see excellent research work placed on record instead of being hidden in the files of a university. The present trend of work and its recording by members of British universities must attract the admiration of all entomologists.—L. P.

THE DIPTERA OF LANCASHIRE AND CHESHIRE, PART I, by L. N. Kidd and A. Brindle. £1 1s, post free, from A. K. Lawson, 25 Rydal Drive, Hale, Altrincham, Cheshire.

In 1880 B. Cooke published the first list of Diptera of Lancashire and Cheshire in *The Naturalist*, 5. Since then additions have appeared in the Reports of the Lancashire and Cheshire Fauna Committee mostly in the lifetime of Harry Britten. He was a great collector and from his arrival in Manchester in 1918, inspired the entomologists of the north-west.

The present work is acknowledged as being based on these reports and on Britten's record cards. But the authors have searched widely and produced an authoritative list. Few counties can have attracted 122 collectors of diptera as listed in this *Part I* which deals with the Nematocera, Brachycera and Cyclorapha—Aschiza. The list is informative, giving, as far as possible, flight period of the adult as established locally, vice county distribution, with stations quoted if less than five. An approximation of frequency is stated and a summary of habitat of adult and immature stages where known, and some habit data of ecological significance. There is a useful bibliography with further references quoted in the text. As in all county recording, coverage is weak in places and some records in a few families remain based on old records of the few experts capable of identifying the specimens.

This excellent work should attract data from the other dipterists collecting in these counties, and should stimulate Yorkshire dipterists and those of other counties to emulate their north-western friends. The only regret is that the nomenclature used for the Syrphidae does not follow the *Royal Ent. Soc. Handbook* of R. L. Coe.—L. P.

HANDBOOKS FOR THE IDENTIFICATION OF BRITISH INSECTS: Vol. V, Pt. 5(b). Coleoptera: Phalacridae. By R. T. Thompson. 17 pp., 47 figs. Roy. Ent. Soc., London. 1958. 3s. 6d.

The present Handbook seems to be among the best of those on Coleoptera issued up to now in this welcome series, being a model of concise thoroughness, clarity, and (as far as we can judge) accuracy. A high level of excellence is, in the nature of things, less difficult to attain where the material to be dealt with is of narrow scope—as here, with only three genera and some 15 species in our fauna; even so it cannot always be said in such cases, as it can here, that the author's grasp and treatment of his subject strike us as entirely sound and beyond criticism.

The Phalacridae, a somewhat isolated family of small, shiny, round-oval, phytophagous Clavicorn beetles of mostly very uniform appearance, have from early times offered difficulties in specific separation owing to the variability of such obvious features as size, colour, and even shape in certain cases, while the reliable distinctions are generally microscopic; consequently they have on the whole been much neglected. The discovery, however, that the larvae of *Phalacrus* spp. feed in the smutted inflorescences of grasses—including those cultivated as cereals—eating the spores, has led to a certain amount of interest in their biology of late, though the life-history is but very imperfectly understood in *Olibrus* and scarcely at all in *Stilbus*.

The known facts are brought together here in an introduction in which also such topics as the use of the various diagnostic characters are fully discussed, with a section on nomenclatural matters. Of the former, the most important are those of the genitalia, notably the male tegmen and the apex of the female ovipositor, here extensively used for the first time; the microsculpture of the upper surface, now long recognized as of determinative value; and the armature of the fore tibiae—i.e. the small spurs or pegs concentrated towards the apex of their outer margins—which affords good distinctions previously little noticed.

The keys are readily workable, and profusely illustrated with clear line-drawings. The only changes in our list of species as given by Kloet & Hincks (1945) are: *P. brisouti* Rye (= *hybridus* Flach, a synonymy confirmed by the author *in litt.* but not mentioned in the book) becomes *finetarius* F. (not Payk.); *P. nigrinus* Marsh. reverts to the more widely used *caricis* Sturm; *P. brunripes* Bris. and *O. particeps* Muls. are, provisionally at least, dropped as British and are considered among the three 'doubtful and reputed' species at the end. *P. championi* Guill., hitherto unrecorded outside this country, has been found to have a new synonym in the Swedish *P. suecicus* Palm. The novel suggestion is put forward tentatively that *Stilbus atomarius* L. may be a hybrid between the other two British species of the genus, on the grounds that most of its characters are intermediate and it is said to be found only where they both occur. Since the tegmen is markedly different in all three, however, it would seem improbable according to our present notions of specific criteria.

Altogether, Mr. Thompson is to be congratulated on a first-rate piece of work, substantially advancing and clarifying our knowledge of an obscure group.—A. A. A.

Obituary

HUBERT McDONALD EDELSTEN.—British entomology has suffered yet another grevous loss in the passing on 2nd May 1959, at the age of 81, of one of its leading and most distinguished lepidopterists, Hubert McDonald Edelsten, who will always be remembered for his great interest in the fauna of the Fen Country and everything connected with it. He was born in 1877 at Stamford Hill, the eldest son of F. A. Edelsten, who was himself a keen naturalist and it was from his father that he derived his first incentive for entomology. While at school at Brighton, Hubert Edelsten used to roam the downs in search of local insects, in particular butterflies and moths, at the same time becoming quite an expert at taxidermy.

It was in 1887 that his family moved back into an ancestral home at Enfield which was well in the country in those days. He used to tell of the wealth of lepidopterous life which that area afforded at the end of the last century, and during his early days there he added many species to the Hertfordshire and Middlesex County lists. In the year mentioned above he first met that celebrated naturalist and botanist, E. A. Bowles, with whom he founded the Enfield Natural History Society. It was Bowles who helped to enhance his interest in Nature and, above all, to make him an enthusiastic gardener, especially in the growing of crocuses which he kept up till the end of his life, winning prizes at many shows, including the Royal Horticultural Society, and even having varieties named after him.

But Entomology virtually took pride of place and Edelsten soon acquired that love of the Fens and Broadland which never deserted him. Possibly this appeal was originally inspired through his early shooting days with Harry Cator at Woodbastwick on the Broads, since he was adept with a gun and had been a keen wildfowler. When quite young he joined his father's firm of shipping merchants between England and Australia, but in his spare time from the City he would always visit some out-of-the-way haunt for collecting, though he never went abroad and seldom very far afield in this country.

His special interest in fen and marsh insects first came really into prominence when he published a paper in this Journal in 1909 on the identity and early stages of *Nonagria neurica* Hbn., now known as the Sussex Wainscot. But J. W. Tutt, not being satisfied that the species discovered on the South Coast shortly afterwards was in fact the one originally described by Hübner, named the new insect *Nonagria edelsteni*. But this name was eventually dropped when it was evident that the species in question was in fact *N. neurica* Hbn.

Wicken Fen was almost a second home for Edelsten together with its adjoining fenland. He was always studying the lepidopterous fauna of this region and had an unrivalled knowledge of it and the group of Noctuid moths commonly known as the Wainscots. He bred nearly all the recognised species of this group, in fact he was a remarkably successful breeder of a great many of our Macrolepidoptera. In 1944 in collaboration with the late Sir John Fryer, who was his lifelong companion in the field, he published the life history of that elusive little moth *Hydrillula palustris* Hbn. of which very little was known of the female. His joint efforts and researches have now made it possible for the larva to be found freely in its restricted haunts. Shortly afterwards he also

published the life cycle of *Oria musculosa* Hbn. by visiting the Salisbury locality where it had appeared in numbers.

When he gave up his City business in 1935 he was awarded a special grant to work at the British Museum (Natural History), and became occupied with the reorganising of the collections of British lepidoptera there and was eventually put in complete charge of them. During the Second World War he joined the staff of the Plant Pathology Centre at Harpenden which came under the Ministry of Agriculture and did valuable work in helping to exterminate several serious outbreaks of the Colorado Beetle. For his signal services in this field he was appointed O.B.E. It was during this period he lost his only son in action, a blow which told very much on him. He became a widower in 1954.

Edelsten was elected a Fellow of the Royal Entomological Society as far back as 1902 and was a regular attendant at the annual Verrall Supper for over 50 years. Through his interest in Wicken Fen he became Secretary for the fund raised to help the upkeep of that famous preserve. He was closely associated with the Society for Nature Reserves and was on the Committee for the management of Woodwalton Fen till it was taken over by Nature Conservancy. He was also Chairman of the Committee for the Protection of British Lepidoptera. In 1939 he was editor of a new edition of Richard South's "Moths of the British Isles" and at the time of his death he was engaged on the production of another up-to-date edition embodying all species newly added to the British list, which is expected to appear shortly.

This account of his various interests and active life would not be complete without reference to his achievements in the athletic field in which, as a young man, he shone. For in his early days he was an expert skater, a very good swimmer, a keen player of ice hockey and, above all, a first-class oarsman, rowing in many regattas on the Thames and on the Norfolk Broads, and was for many years a member of the Broxbourne Rowing Club. In the First World War he served in the Anti-Aircraft Division of the R.N.V.R.

Edelsten was of the most genial and kindly disposition and his cheerful and charming presence will be greatly missed in many spheres, not least in the Natural History Museum where he was working till within a month of his passing. When there he was ever ready to help anyone who wished to make use of his expert knowledge of our lepidoptera and, in particular, he was always keen to help and inspire the younger generation in this field. A wide circle who knew him mourn a true and gracious friend and their sympathy goes out to his only surviving daughter.

C. G. M. de W.



So grows a tree

Seed and shoot, sharpness of bud, first paired leaf. So grows a tree. On which one day a child may swing or lovers carve their names, a tree which can out-stature the man who sowed it, yet may be killed by something no greater than a speck of dust.

Individually, root-lesion nematodes (*Pratylenchus penetrans*) are almost invisible to the naked eye. But in their teeming swarms—many thousands may feed on the root system of a single seedling tree—they are capable of such destruction that an entire nursery may be made utterly useless and the land have to be abandoned. Even crop rotation is of no avail, for the nematodes return to the attack the moment the original crop is replanted, even after an interval of several years. The only hope is complete fumigation of the soil, and in the Netherlands, where agricultural land is restricted and every acre must be used to advantage, it has been found that there is one outstanding method of such soil-cleaning: with D-D Soil Fumigant, developed by Shell.

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THE ENTOMOLOGIST'S RECORD

AND JOURNAL OF VARIATION

Edited by S. N. A. JACOBS, F.R.E.S.

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Biological notes on *Aricia agestis* (Schiff.) in Britain

Part III.

By F. V. L. JARVIS, B.Sc., F.R.E.S.

As many of the results to be described in this paper are continuations of work previously published in the "Entomologist's Record", it is suggested that reference be made to the following numbers:—Vol. 70, Nos. 6, 7-8, and to a paper by Mr. T. W. Jefferson, Vol. 70, No. 5.

The best method of presentation again appears to be under a series of sub-headings:—

Behaviour of ants in relation to A. agestis larvae.

On the Downs at Winchester the mounds of the yellowish ant *Lasius flavus* (Fab.) are common in one area where *A. agestis* flies in company with *P. icarus* and *L. coridon*. Through the thin surface turf of these mounds there is frequently a growth of rock rose (*H. vulgare*). I removed one mound on 3rd July and transplanted it in a sunny garden border stocked with rock rose. *L. flavus* is seldom seen on the surface; and when disturbed workers quickly disappear underground. Two grades of workers were in this mound; at the base and well below ground was congregated a small type about 3 mm. in length, but nearer the ground larger workers (5-6 mm.) predominated.

On 16th August a newly formed pupa of *A. agestis* was found low down in the turf close to one opening of the nest. As the nest was removed from Winchester early in July when the larva had recently hatched it is probable that the egg had been laid on rock rose on the mound.

On the same day we commenced experiments with *A. agestis* larvae from Royston stock and the ants in this nest. An Instar V larva was placed at an entrance after the ants had been slightly disturbed. Two large workers commenced to stimulate the larval papillae on segment XI. The larva must have secreted from the honey gland as the mouth parts were moving in the act of absorbing. This was at 4 p.m. on a warm day. After a short period the larva was placed near a nest of the black ant *Lasius niger* (L.). These workers attacked it and had to be removed.

Three Instar IV *agestis* larvae were placed near *L. flavus* workers. Again attention was given to the honey gland and in one instance some solidified secretion was removed and eaten. The larvae were undisturbed and continued to feed. Again it was the large workers that attended to the larvae.

Several more contacts were made in the next few days. In each instance the large workers attended to the larvae, going directly to the honey gland on segment X. Only a desultory interest was taken in Instar III larvae. Possibly at this stage the honey gland is only functional in a reduced degree.

On August 24th four larvae (3 in Ins. III; 1 in IV) which were feeding slowly and assuming the dull diapause colour were placed on sand in a wide glass tube three inches in length. The tube was buried in the surface of the nest but both ends were open to give free passage to the ants. Despite a regular flow of ants over six hours, the larvae were ignored but when an active and mature Instar V larva was introduced it was serviced at once by all the ants who could find standing

room! Obviously there is no secretion once the lethargy of diapause is operative. If a hygienic service is performed by these ants it must take place during active larval growth.

On 17th August fourteen univoltine larvae segregated from a late June Royston *agestis* ♀ were placed on a portion of the mound where rock rose was growing freely. Five larvae were in Instar II; 6 were in III, and 3 in IV. Once amongst dense turf it is extremely difficult to find these larvae again as they drop at the slightest touch, but on 4th September I found two Instar III and three Instar IV larvae in diapause on the basal leaves of rock rose close to the ground on the summit of the nest. Although so far I have not seen a worker attempt to move a larvae, it was noticed that the earth works debris covered most of the larvae. Late in October all these larvae, now in Instar IV, were still in approximately the same situations and on 17th January two larvae were recovered in a healthy condition.

About 35 larvae hatched from ova laid by a Durham coastal *agestis* ♀ in late July were sleeved on two pots of rock rose and grass embedded to the rims in the sides of the ant mound. Rubber sealing prevented ingress of predators at the base of the sleeves. Wooden tubes were inserted through the earth of the pots to give access to ants. On several occasions in late August and September ants were found in the pots. No servicing was observed, but in late November 30 larvae in diapause were collected from the pots. Half of these larvae were used for refrigeration and temperature tests—with, I regret to say, considerable mortality—but of the other 15, thirteen survived the winter in their pot on the ants nest. Their subsequent behaviour was not so commendable owing to unsuitable food plant but these results indicate that the association with this ant produced better overwintering results by the methods previously described. It seems that any association with *Lasius flavus* is casual and possibly only necessary prior to diapause. Perfectly formed imagines can be reared from summer larvae and from spring larvae after diapause without any attention from ants.

We think that much more work could be done on this subject. In particular the recording of ant species in relation to field sites of *A. agestis* and other *Lycaenids* could yield valuable data.

Univoltine forms at Royston (Herts.).

I had noted (Vol. 70: No. 6, p. 145) that two larvae from ova deposited by a late June ♀ from Royston in 1957 entered diapause in August but died in November. These were clearly univoltine in character as the remainder of the brood (37 individuals) produced an emergence in August.

In 1958 we were more successful. From a Royston ♀ taken on 27th June about 50 ova were obtained. By 9th August the larvae, feeding on rock rose, had sorted themselves into two groups:—

- (a) slow feeders; comprising 5 in Instar II and 8 in Instar III.
- (b) rapid feeders; 13 in Instar IV and 9 in Instar V.

All in group (b) completed growth and emerged in the last week in August and first week in September. Ten pupae were used for temperature treatment. Feeding in group (a) became progressively slower and, as already described, these larvae were placed on the nest mound of *Lasius flavus* where all that I could find later in the autumn passed

into diapause in Inst. IV. None completed development to maturity in 1958 so we can be quite sure that these larvae were univoltines.

Two Inst. IV larvae were extracted from the ant nest in November and kept at 34° F. whilst a further two were found in January 1959. All the larvae were slowly warmed to 60° F. in late January and placed on a pot of forced rock rose. All fed for two weeks and grew slightly and then three died. I suspected the rock rose as it is a plant that is impossible to free from aphids which multiply quickly in the warmth and soil the leaves with honey dew. I had this trouble in previous years with *agestis* larvae dying after coming safely through diapause but at that time there was no alternative food plant. However this year I placed the surviving Royston larvae on the winter leaves of *Geranium rotundifolium*. Feeding commenced at once and the larva developed to maturity with no trouble, emerging as a large female on 20th March and confirming the univoltine cycle. Had this larva been allowed to develop in outdoor temperatures instead of 60°-65° F. its emergence would have taken place in June. Length of diapause: 4½ to 5 months.

At Royston the first emergence is rather prolonged, extending in average years from late May until the end of June, and it seems that the late June individuals are either univoltines or carry factors for univoltinism, indicating that at some period in the not so remote past there has been overlapping and interbreeding between the northern univoltines and the southern bi-voltines which probably never reached further north than the Midlands.

Up to the present it has not been possible to induce northern larvae reared in the south of England to depart from their univoltine character, indicating that univoltinism is an integral part of the genetic formula. The slightly higher average temperature of the South will not suspend larval diapause but an experiment to be described later suggests that the daily hours of daylight to which the larvae are subjected from the moment of hatching play an important part in determining or suspending the onset of diapause. It was found that the larval diapause in Southern *agestis* could be completely suspended and *all* the ova in a batch brought to maturity as a third emergence in late October by subjecting the ova and larvae throughout their growth to 16.5 hours of light in each twenty-four hours. It could be inferred from this experiment that the diapause threshold for Southern *agestis* is about 15 hours. Above this figure in June, July and August the larvae are unlikely to pass into diapause but when the natural daylight falls below the threshold in late August, ova hatching from the second brood no longer having the long daylight stimulus will pass into natural diapause.

It is possible that the northern univoltines, evolved in an area with long summer daylight hours, may have a diapause threshold of the order of 17 hours, which would account for their strict univoltinism when brought South. It is hoped to obtain sufficient northern material this year to put this theory to the test.

Suspension of diapause in A. agestis larvae.

On 27th August 1958 I took a female *agestis* near Arundel, Sussex, and over the next four days obtained ova on *Helianthemum vulgare* (rock rose) and *Geranium sanguineum* (Bloody Cranesbill). The ova were separated into two groups.

Group I (44 ova) were kept outdoors in a gauze cage protected from direct sunlight. They were hatched on growing plants of rock rose about 11th September. Growth was slow and many larvae died during October but eventually seven survivors entered diapause in Instar III at the beginning of November. They were then placed in a glass tube open at one end and the tube was inserted into the side of the nest mound of *Lasius flavus* at a position where ants were still active. The tube was removed after 14 days and the larvae placed in the refrigerator at 38° F. Outdoor temperatures were not low over the growth period, falling from an average of 58° F. early in September to 54° F. in late October.

At the end of January 1959 these larvae were slowly warmed to 60° F. Three out of seven survived and fed steadily on *Geranium rotundifolium* to give emergences as follows:—

4th April—one male and one female.

6th April—one female.

The period of diapause for these larvae was $2\frac{3}{4}$ months.

It is safe to assume that none of the larvae in this group would have developed to give a third autumn emergence; all, had they survived, would have passed into diapause to produce the normal first emergence in May and June.

Group II (40 ova) were kept indoors at an average temperature of 62° F. In previous years it had been observed that larvae resulting from August females would pass into diapause at this temperature. There was one exception in 1957 when a partial third emergence was obtained but the eggs in this instance had been laid in the first week in August when there was over 16 hours of daylight, i.e. over the critical threshold value.

But by the first week in September, when these eggs were due to hatch, the daylight value had fallen to 14.3 hours. Therefore it was decided to maintain 16.5 hours of light daily throughout the life of this group. The pots of *H. vulgare* and *G. sanguineum* were kept close to a window (out of direct sunlight) during the day and from 7 p.m. to 11 p.m. were illuminated by a 40 watt bulb from a distance of nine inches. Hatching commenced on 5th September. Growth was uniform and all 40 larvae pupated between 11th and 23rd October. There is no doubt in my mind that the maintenance of the high summer value of light suspended larval diapause to give 100% third emergence.

The pupae were divided into three batches:—

- (a) 5 larvae ready for pupation were placed in a temperature of 90-95° F. until emergence. Pupal stage occupied 6-7 days.
- (b) 17 pupae were kept as controls at 60-65° F. Emerged 20th-26th October.
- (c) 18 pupae *immediately after pupation* were placed in 38° F. for 20 days. After the chilling, the pupae were allowed to complete development at 60-65° F. Emergences were in the latter part of November.

Proportion of sexes.	♂ ♂	♀ ♀
(a)	2	3
(b)	11	6
(c)	7	11
	—	—
	20	20

Group (a) and (c) were introduced as further checks on previous experimental work on initial pupal chilling or heating to produce imaginal colour changes and pattern alteration. The results completely supported the findings published in Vol. 70, Nos. 7-8, with the additional information that *high* pupal temperature moves the underside pigmentation towards deep yellowish brown and increases the size of the black underside spots.

It is important to note that in this experiment there was no change in larval colourings due either to varying food plant or temperature. All the larvae conformed to the southern pattern with a well defined rose-purple spiracular band and dark dorsal line at maturity.

Completion of data for Durham coastal agestis "(salmacis)".

In Vol. 70, Nos. 7-8, p. 170, it was impossible to describe larval instars beyond the third as no larvae at that time had developed after diapause, but in the early spring of 1959 three larvae out of thirteen which survived diapause successfully completed growth to give male imagines early in April. More would probably have been saved if *Geranium rotundifolium* had been used as food plant from the commencement of feeding instead of the forced rock rose which was contaminated by aphids. All larvae were grown at 60°-65° F., with Southern *agestis* larvae in the same environment as controls. As in the experiment already described with Arundel larvae, and in the light of previous experience I am satisfied that neither temperature nor food plant have any effect in altering larval colouring from the normal.

This is mentioned because the mature larvae were so different from southern *agestis* and *artaxerxes* raised in a similar environment that doubts regarding the accuracy of my description could have been raised. All the three larvae developed to the same colouring. It is now a matter of considerable importance to rear more of these Durham coastal larvae to establish whether this distinctive larva is confined only to the north east littoral or whether it is also a form characteristic of the northern inland univoltines.

Before describing the later stages, it is as well to recapitulate the data from which the descriptions of the first three instars were obtained (p. 169-170).

- (1). 41 ova were collected at Blackhall (Co. Durham) in July 1957. Most of these hatched and twelve larvae in Instar II were examined on 9th August. Four were whitish and eight pale grey green. The eight larvae possessed colourless tubercles bearing white setae; the darker larvae had light brown or greyish brown tubercles with pale grey setae. Only two of the darker group showed a decidedly darker dorsal line and, again in this group, three larvae showed traces of purple in the spiracular band. In the third instar the colourings were similar. The light green ground colour was slightly brighter than in Southern *agestis* or *artaxerxes* and in diapause the pale drab colour was tinged with yellow.
- (2). A few ova were collected from Blackhall in July 1956 but only three larvae passed into diapause. Two of the larvae were pale grey green with darker dorsal line and traces of purple on the band. Light brown tubercles with pale grey setae. The third

larva was much paler. In diapause all three larvae were pale yellowish olive as distinct from the buff of *artaxerxes* or dull brown of Southern *agestis*.

- (3). In July 1958, about forty ova were deposited at Bognor by an *albi-annulata* female taken at Blackhall. Thirty larvae passed into diapause in Inst. III. Prior to diapause twenty of these larvae were the pale form closely resembling *artaxerxes* except that the green was a shade deeper. In the remainder, the grey-green colour was deeper. There was a more or less distinct dorsal line and traces of pink or purple in the spiracular band.

From these results it can be seen that the Durham coastal larvae tend to be somewhat variable in the early instars, a peculiarity not observed with either Southern *agestis* or *artaxerxes*.

I have only one record for the inland Durham larvae when in July 1957 ten larvae were obtained from ova collected at Sherburn. In Instars II and III these larvae were consistently pale green with faint dorsal lines. Pale or medium brown tubercles carried colourless or light brown setae. There was noticeable purple shading in the spiracular area—in fact these larvae were very similar to Southern larvae from Royston. Obviously more data are needed from this area.

Returning to 1959, we can now complete the description of the last two Instars from the three larvae which before diapause were of the paler Durham coastal type.

Instar IV.

Pale green with paler lateral chevrons. The dorsal line is medium brown at the intersection of the segments. The subspiracular line is pale buff or pinkish buff edged above and below with light purplish red, particularly on segments VI to XI. Prolegs buff: tubercles and setae whitish: head black.

Instar V.

Bright green with paler lateral chevrons. Well defined purplish brown dorsal line, particularly at intersections. The sub-spiracular ridge is dingy white soon after moulting, becoming chalky white at maturity. It is shaded above and below with pale brownish grey, which colour extends around the anterior and posterior boundaries of all segments and chevrons. Immediately after moulting the larvae showed a trace of pink in the spiracular band, but this quickly disappeared. On the dorsal surface of segment I is an irregular whitish patch containing a few brown tubercles and setae; otherwise all tubercles and setae are white. The papillae on segment XI are white. Thoracic legs grey brown; prolegs buff; head black.

It will be observed that up to Instar IV there is a tendency to show the purple shaded *agestis* pattern but in the final instar this colouring is lost and the mature larva shows no pink or purple at all. In this respect it is more extreme than *artaxerxes* which has a constant light pink shading in the spiracular band. In Southern *agestis* at maturity the spiracular band is pale crimson heavily shaded above and below with purple-crimson.

On 19th May 1959 Mr. Jefferson sent me an Instar V larva which he had collected the day before at Blackhall (Co. Durham). It appeared to be the mature stage of the darker larval forms described in the early instars. The ground colour was a deeper green than the three reared larvae (which were the pale type in the first three instars). The dorsal line was dark brown and distinct; the usual lateral chevrons were well defined; there was a whitish dorsal patch on segment I; prolegs buff and thoracic legs light brown: head black: tubercles, papillae and setae white. The interesting feature was the sub-spiracular region. The ridge was white shaded above and below with deep brownish grey, but in strong daylight, particularly when the body was contracted, a decided purple tinge appeared in the dark shading.

Under a magnification of 100 diameters with a binocular microscope it was found that there was a layer of dark red-brown pigment 0.2 mm. beneath the cuticle mainly on the dorsal boundary of the spiracular ridge. Under the cuticle was a translucent pale grey zone. On the floor of this zone and apparently covering the dark pigment were flocculi of bright pink but as these were only clearly visible in strong daylight and invisible in artificial light it is possible that they were an absorption and reflection effect and not actual pigment. The pink layer in combination with the underlying dark pigment and the translucent zone produces the variable purple appearance in the sub-spiracular band.

The pale larvae showed very little pigment and no pink tinge after the first two days in Instar V.

In comparison the adult larva of Southern *agestis* has a similar deep brown pigmented layer but the zone beneath the cuticle contains semi-transparent rose purple pigment which diffuses into the central ridge so that the whole sub-spiracular band is strongly coloured with this shade.

It thus appears that the Durham coastal larvae are variable with a possible predominance of the lighter type. Both forms described are distinct from Southern *agestis* and from *artaxerxes*. It remains to be seen whether this phenomenon is confined to the coast or is general in the Northern univoltines.

Mr. Jefferson's larva was found on *H. vulgare*, but was transferred to *G. rotundifolium*, which it ate readily

Pupa (from pale larvae).

Thorax and wing sheaths light bluish green. Abdomen pale buff with medium brown dorsal line and whitish spiracular band. Anteriorly there is a thin black border to the eye. This pupa differs from the other two forms (Southern *agestis* and *artaxerxes*). The Blackhall pupae were larger and more slender than three pupae of Southern *agestis* (from Arundel) and (one from Royston) formed at the same time and although there were only seven pupae to measure it is worthwhile recording the following figures:—

	Pupa.	Length.	Dorsal width at junction of thorax	Ratio. Length
			with abdomen.	Dorsal width.
Durham	1 ♂	11.5 mm.	3.5 mm.	3.3
"	2 ♂	10.5 "	3.2 "	3.22
"	3 ♂	10.0 "	3.0 "	3.33
Arundel	1 ♂	9.2 "	3.1 "	2.97
"	2 ♀	9.5 "	3.2 "	2.97
"	3 ♀	8.8 "	3.0 "	2.93
Royston	♀	10.0 "	3.4 "	2.92
(Univoltine)				

If a large number of measurements confirmed the slenderness of the Durham pupae we should have a further racial or sub-specific distinction.

The three imagines were all males of large size. The upper surface was blackish brown with much reduced orange lunules. One specimen showed some white scaling in the forewing discoidal spot. Fringes on forewings heavily shaded with dark brown. Undersides possessed the usual spot pattern. The ground colour was deep grey-brown on forewings and deep brown on hindwings.

Suggested classification of Aricia agestis in Britain.

From the results described in this paper and the preceding Parts I and II, it appears that *Aricia agestis* can be divided into two groups separated essentially by voltinism.

- (a). The Southern uniform race, bivoltine and potentially trivoltine; probably identical with *A. agestis* occurring in lowland areas of Western Europe. It spread into Southern England after the last glaciation.
- (b). The Northern group, strictly univoltine, comprising the ssp. *artaxerxes* in Scotland, and what, in relation to Southern *agestis* should be logically regarded as a second sub-species, namely the univoltines extending across Northern England from Yorkshire and Durham to Westmorland. *Artaxerxes* has already been given the status of sub-species but it would now appear that the northern English forms should rank equally with *artaxerxes*.

This form differs from Southern *agestis* in the following manner:

- (1). There is the definite character of voltinism. Northern univoltines do not become bi-voltine when reared in the South.
- (2). Imaginal characters, comparing both wild specimens and individuals reared in controlled environment.

The ground colour of the upper surface in both sexes is a deeper brown, approaching black in the Northern insects. The orange marginal lunules are greatly reduced in size and number in the North. In the western half of the northern distribution, particularly, there is a marked tendency for white scaling surrounding the forewing discoidal spot. Body hair in the North is definitely brown, whilst in the South the colour is generally bluish-grey.

Underside colour in the North is darker than in the South; there is a greater tendency to pupil reduction and obsolescence. In the South it is easy to separate the sexes visually because of the large orange

lunules marginating the wings of the females (uppersides) but in the North there is less difference in the sexes; in fact on the Durham coast it is often extremely difficult to separate living males and females without examining the genitalia.

The dark ground colour and reduced marginal lunulation apply equally well to ssp. *artaxerxes* but the white discoidal spots and reduced pupillation are sufficient distinction for this sub-species.

It seems impossible to separate the bulk of the Durham coastal *agestis* from forms occurring inland, if we leave out for the moment the small proportion of *artaxerxes* forms which, according to T. W. Jefferson, comprise about 5% of the population and the still smaller proportion of discoidal spot aberrations such as *garretti*. Possibly the undersides of the coastal specimens are deeper in colour than inland forms but that seems rather a fine distinction. Unfortunately, in his original description of "*salmacis*", Stephens described a female *artaxerxes* form. This seems to have clouded the issue for over a century but if the Durham coastal forms are to be regarded as sub-specific or even racial, the distinction must be apparent in a typical sample of specimens held in comparison with a similar sample taken from an inland colony. This does not seem to be the case and one could not define the race from a small aberrant fraction. It seems safer to postulate that the *artaxerxes* forms on the Durham coast may have arisen by infiltration of true *artaxerxes* from Scotland in a fairly recent movement late in the Pleistocene. With the *artaxerxes* character fixed genetically, this form would appear constantly. At the same time there was probably some interbreeding with the resident univoltines to give such forms as ab. *garretti*.

As to whether coastal Durham forms are racially distinct from the bulk of the northern English univoltines seems now to depend on the larval colouring already described. We have seen that there is a distinctive larva which could be sub-specific. It now remains to be seen how the larva is distributed.

As a sidelight on the question of the origin of northern forms, it has already been described in Part II (and since confirmed in 1958) that cold treatment of pupae immediately after formation produces in Southern *agestis* the following northern characters:—

- (1). Reduction of orange lunulation: the "*allous*" tendency.
- (2). Deepening of the brown upperside colouring.
- (3). Increase of white scaling in forewing discoidal spot, giving ab. *garretti* in a few instances.
- (4). Increasing tendency to obsolescence.

This is an indication of the evolutionary pattern trend but in the existing northern forms these tendencies appear to be fixed and not reversible. With both *artaxerxes* and the few Durham specimens reared at 60°-65° F. in my experiments, the northern characters of dark colour, reduced lunulation, etc., have not been lost. We seem to be making progress towards the solution of the problem but a great deal still remains to be done.

SUMMARY

- (1) Behaviour of ants in relation to *A. agestis* larvae.

The relations of workers of the yellow ant *Lasius flavus* Fab. from a transplanted colony are described in relation to larvae

of *A. agestis* during summer and autumn. From these observations it appears that association is casual and possibly only necessary prior to diapause.

- (2) Univoltine forms of *A. agestis* at Royston.

It was possible to isolate a few specimens of this form which occurs as a small fraction of the bi-voltine populations at this locality.

- (3) Suspension of diapause in *A. agestis* larvae.

An experiment was described in which it was possible to induce 100% of a batch of ova laid by a late summer *A. agestis* ♀ from Sussex to develop without larval diapause to give an emergence in the autumn. The method was to submit ova and larvae throughout their growth to 16.5 hours of light daily. A control batch of ova from the same parent produced larvae which passed into diapause.

- (4) Completion of data for Durham coastal *A. agestis*.

In part II (*Ent. Record*, 70: 170) it was only possible to describe the larva of this "*salmacis*" form to the third instar. During the winter of 1959 larvae were brought successfully through diapause to emergence. Instars IV and V and the pupa are described. As indicated from the early stages there appear to be two larval forms with possible intermediates. The "*salmacis*" larvae showed definite differences from the larvae of both southern *agestis* and from ssp. *artaxerxes*. In conclusion, a tentative theory for the origin of the Durham coastal population is suggested.

Key to Plate Illustrating Experiments Described in the Text.

The rows read horizontally.

- Row 1.—Reared from a June 1958 Royston ♀. Nos. 1, 3, ♀♀, Bi-voltine controls, emerged September 1958. No. 2, Univoltine ♀ emerged at 60°-65° F., 3rd March 1959.
- Row 2.—♂ and ♀ from the same Royston ♀; pupae kept at 34° F. for 20 days, emerged September 1958 (Bi-voltine). Forewings suffused with copper and undersides ab. *caeca* in both specimens.
- Row 3.—Reared from a late August 1958 Arundel ♀. ♂, ♂, ♀, Group II (diapause suspended by light treatment), emerged October 1958. (Experimental third emergence.)
- Row 4.—♂, ♀, ♀, Group I, from the same Arundel ♀, over-wintered (diapause) larvae, emerged at 60°-65° F., April 1959 (normal Bi-voltine behaviour).
- Row 5.—From pupae in Arundel Group II, kept at 38° F. ♂, ♂, ♀, emerged November 1958. (Experimental third emergence.)
- Row 6.—Reared from a Blackhall (Co. Durham) ♀, July 1958. Univoltines from over-wintered larvae, ♂, ♂, ♂, emerged at 60°-65° F., April 1959.
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FOOTNOTE

Since writing the text of this paper, the dark larva from Blackhall (Co. Durham) has pupated. As the colouring is distinctive, it needs to be described:—

Thorax and wing sheaths light yellow green shaded with olive; abdomen light ochre yellow: sub-spiracular band dark reddish brown intersected with pale buff; dorsal line dark brown: a thin brown line margins the eye anteriorly. Length 8.2 mm. Dorsal width 2.2 mm. Ratio: Length ÷ Dorsal width 3.7.

The Use and Abuse of the M.V. Trap

The m.v. trap has come to stay and is indeed very useful but it has seduced large numbers of collectors from research in the woods and fields. It should be used primarily for recording the insects of a district.

I presume that no one in these days puts any lethal chemical in the trap but I have read of a collector who thought it great fun to throw the moths he did not want to the birds; he should give up entomology and take to ornithology.

For the purpose of keeping records of the moths occurring in one's own district, every moth should be boxed, counted and recorded day by day. All the moths, with the exception of the one or two required for one's own collection, should be carried at least half a mile away from the trap and there released. I have had two return to me from half a mile away. A *Lampra fimbriata* Schreb. with a forewing damaged in a peculiar manner came back and was in the trap the following morning. A *Catocala nupta* L., also with a wing damaged in a peculiar way, also returned to the trap. These are the only two definite instances I have noted in the seven years the trap has been used. Some collectors throw the insects out on a flower bed or on the grass in the morning and light the trap in the evening a few yards from the discarded moths. This is no use for records.

I admit many users have not the time to spare in the morning to box and subsequently release each insect, but practically all moths will keep quiescent until the evening.

To get the best results one should get up at dawn, cover over the trap with a net bag and take it into the hall or a room. All moths on the ground sheet and round about are collected and boxed. After breakfast the trap is emptied. I find that about 10%, more or less, of the moths in the trap have come up into the bag and another 10% or 15% are lost if those around the trap at dawn are not collected.

A friend of mine has an ingenious alarm clock shutter on the trap, which closes it up at dawn, but he still loses those around the trap.

Most collectors belong to some natural history society, and although they may not publish their records, they should at least pass them on to the Recorder of their local society. The scientific journals are not very anxious to publish long lists of moths from a limited locality, but your local society may be very pleased to include your records in the annual Transactions.

I have given up the cardboard egg containers, and now use the cardboard apple trays cut up to fit; it is so much easier to box the moths from the latter without damage.

C. C.

Practical Hints

Collectors who take females of *Antitype xanthomista* Hub. should remember that of the eggs which they lay in captivity, a proportion hatches in September or October, the remainder 'going over' to the following spring. Therefore do not put eggs of this moth away to

look at next February or March, and do not throw away eggs that fail to hatch in October. One can buy from nurserymen a large form of thrift, *Armeria maritima*, which can easily be grown in flowerpots and is just the thing for the young larvae. If you do buy growing plants, however, search them most carefully for predators before you pot them, also use sterilized earth. Expose plants and larvae to all the sunshine procurable. An occasional dampening with warm rain water in a mist syringe of an evening is beneficial.—O. M. H.

Larvae of *Hyloicus pinastri* L. may be beaten from *Pinus sylvestris* (Scotch fir) at the end of July. As the moth has a very long period of emergence, from the middle of May until August, larvae will be found in nearly all their stages. At first they rest at full length on a pine needle, where their green colour and white lines make them very inconspicuous: in the last instar, when they are too big to rest on a pine needle, they take to the end of a twig: by this time most of them have assumed a brown colour which harmonises admirably with the twig. Some larvae, however, remain predominantly green, though this colour is broken up into a mottled pattern. Care must be taken not to supply them with succulent young needles, as these will prove fatal. Tough old needles of the previous year's growth are the most favoured. The best trees to beat are isolated mature trees on open heaths: these are often stunted and easy to beat.—H. S.

In the last few years, *Nola albula* Schiff. has often been recorded at light from localities in the eastern and southern counties, from Suffolk to Devon. There is also one record for Herts. in 1953. These moths are probably migrants (the Dungeness area figures prominently in these records), but there is always a chance that a colony may be established in a suitable locality, where there is plenty of dewberry (*Rubus caesius*). The moths crawl up the long grass and take to the wing at 9.30 p.m. B.S.T. They are said to be very punctual. This flight lasts for half an hour. The movement of the moths is very gentle and has been compared to that of a snowflake floating through the air.—H. S.

At the end of July, larvae of *Cucullia lychnitis* Ramb. should be sought on black mullein (*Verbascum nigrum*). They are sometimes to be found on the leaves, but more usually (and in their later stages always) on the flower spikes, where they are very conspicuous. When full fed, the larvae should be provided with coarse dry sand in which to go down and form their cocoons. They often spend two years as a pupa: so too does the above mentioned *H. pinastri*.

Catocala promissa Schiff. appears about the middle of July, *C. sponsa* L. about a fortnight later. Both come early to sugar, at which their shyness is notorious. Instead of settling down for a steady drink, they keep fluttering and showing the crimson of their underwings, and in this attitude they are a beautiful sight. They should be put in the killing bottle as soon as possible, as their behaviour in a box is far from exemplary.

Sterrhya degeneraria Hub. occurs locally at Portland. According to the late Dr. Harold King, it is fairly easily recognized on the wing, as it is a small geometer that looks slightly yellow when in flight, but

it is larger than *S. fuscovenosa* Goeze (*interjectaria* Guenee) which is common in the same locality. Dr. King took one *degeneraria* sitting flat on a flower head of valerian (*Kentranthus ruber*).

Towards the end of July, the exotic looking *Euplagia quadripunctaria* Poda appears in its haunts on the south Devon coast, westwards from the Exe estuary. They have been beaten in numbers from hedges at Starcross and Newton Abbott, but when the writer was staying in Teignmouth a few years ago, he found as many specimens as he wanted, sitting openly on the sides of hedges or on herbage growing at the foot of these hedges or on banks. The best time to look for them was after 4 p.m. B.S.T. Moths were then to be seen in places where there had been none in the morning, and as they were invariably in perfect condition, they had presumably emerged from the pupa early in the afternoon. They could be boxed without difficulty and did not attempt to fly until dusk.

This is also the time when *Leptidia sinapis* L. is on the wing in south Devon. It does not seem to be as plentiful as the first brood, and in some localities there are years when it does not appear at all. Of a small number of eggs collected at Malvern in June 1925 (a hot summer), about half produced imagines of the second brood type in August, and the others passed the winter as pupae from which imagines of the first brood type duly emerged. Eggs may be obtained by following a female engaged in laying, and picking the plants to which eggs are attached.—H. S.

Notes on the Microlepidoptera

By H. C. HUGGINS, F.R.E.S.

CHILO CICATRICELLUS Hub. This species is on the wing at the end of July and the beginning of August, and although I have no doubt that the two British specimens were immigrants, it should be looked for then. I am, however, chiefly writing on the insect now to draw attention to the male, which is, I think, unknown to the majority of collectors and liable to be passed over. The description in Barrett (X: 127) and the figure in Leech (Plate 7: 3) are both of the female, the insect with the conspicuous white costal stripe which was such a feature of Mr. Chalmers-Hunt's beautiful specimen. (In parenthesis it is as well to add that in some copies of "Leech", where the plates were hand coloured, the costal stripe is omitted.) When, as mentioned in a previous note, Mr. E. L. Martin and myself were looking at the alleged "*dotatellus*" at the B.M., he showed me the male of *cicatricellus*. To my surprise, it bears very little resemblance to the female, and in colouration is more like the rather smeary form of the male of *S. gigantellus* Schiff. It is of course smaller, and of the usual chilonid structure and shape. Although I do not think it very likely, there is a danger that it might be passed over as a male of *C. phragmitellus* Hub. which is about at the same time of the year, and varies exceedingly in size, markings and colours. I had always imagined, till Mr. Martin showed me these, that the male was like a smaller edition of the female. It may be significant that both the British specimens were of the large unmistakeable female.

PERONEA LORQUINIANA Dup. The end of July and beginning of August is the time of the year to collect the flower spikes of the purple loosestrife for the larva of this insect, which is then nearly full fed. It may be reared without difficulty by tying the flower spikes up tightly in a canvas bag, and opening it carefully and extracting the pupae, which will have spun on the sides and bottom, about the end of August. I use the word tightly advisedly, for I remember vividly when staying at the "Ferry" at Horning in 1922, collecting a quantity of loosestrife in a bag and tying it up in the usual way, and dropping it in a drawer of the dressing table. The next morning there were several *lorquiniana* larvae walking round the looking glass and generally causing excitement. I think it is one of the most difficult of all the Tortrix larvae to confine. I think *lorquiniana* is generally distributed in the Broads and Fens; I have seen it at Wicken and Chippenham, and also at Horning, Potter Heigham, Stalham and Barton. It has its years, however; it swarmed on the Woodbastwick estate at Horning in 1922, and I gave exact directions in 1924 to the late Sir John Fryer, who totally failed to find it. The old "Ferry" at Horning was rather an amusing place, the bedrooms in several cases had curves in the floor like a film star. It was, however, totally wrecked by a bomb in the last war.

Hints for Beginners

Quite a number of the new subscribers to the "Record" this year are beginners who are taking up the study and/or the collecting of butterflies and moths. I strongly advise them to keep a diary, and use in that diary only the scientific names of the insects seen or captured. If the generic name is also written down they will find that this is of great use in aiding the memory in placing together the various species.

When out on your expeditions keep a small note book in your pocket and write down each day the names of the insects you see, no matter how common, using the English names only if you do not yet know the scientific names. In the evening, transfer the names to your diary, where you will use only the specific name.

The best book I know for the purpose is P. B. M. Allan's "Food-plants", published by Watkins & Doncaster of 110 Park View Road, Welling, Kent. This book contained, at the time of publication, the latest names used in the Department of Entomology of the British Museum.

For illustrations of the species, Richard South's volume of Butterflies and two volumes of Moths of the British Isles will be found very useful. They are published by Frederick Warne & Co., Ltd., 1/4 Bedford Court, Strand, London, W.C.2. One other extremely useful book is the Text Book of British Butterflies and Moths by L. W. Newman and H. A. Leeds. A copy can usually be obtained quite cheaply from one of the natural history booksellers. Allan's Larval Foodplants gives scientific and English names and a list of the foodplants for each species. South's books give at least one coloured illustration of each species with life history, and the Newman & Leeds book gives the life history throughout the year, together with localities and rearing hints.

With these books, a beginner should get a good start. Do not forget that at Christmas time or on your birthday, your parents or friends can, at your suggestion, make you presents of these books.

I am, of course, presuming that no beginners will be using an m.v. trap, but will be going out to the woods, heaths, fields and hedges to learn the life histories of the insects they are studying and collecting.

If while out collecting you meet non-entomologists who become interested and ask questions, it is better to give them the English name of any butterfly enquired about, as they will be no wiser if you use the scientific name only. I had been collecting a good many years, when one day, on the Surrey hills, I met a boy of about eleven years of age with a butterfly net. I asked him if he had seen the Duke of Burgundy, the small pearl bordered, and one or two other species, but he looked at me blankly and said he did not know them; I asked him why not, and he said his father would not allow him to learn the English names and he did not know them. Luckily I knew the specific names sufficiently well to converse with the learned lad.

A beginner can save quite a lot of money if he is handy in making the apparatus he requires. Glass topped and glass bottomed boxes are very dear to buy, but a large number of useful substitutes can be made at about one-tenth the cost of those you buy. From your local chemist you can obtain for about four or five shillings half a gross of red pill boxes. You should push out the bottom of the box and place it on a piece of stiff cellophane. With a thick needle you scratch a circle round the cardboard bottom and cut out the circular piece of cellophane, which will, or should, fit the bottom of the box tightly. With some cellotape round the box and fixed a little less than one-quarter inch over the cellophane, you have a perfectly good box with a transparent bottom. The chemist generally has larger cream coloured pill boxes about $1\frac{1}{2}$ inches in diameter; these are a lot stronger than the red boxes but may be treated in the same way. You should be able to make a couple of dozen boxes in about an hour and a half.

A rearing cage for caterpillars can be made from a large cardboard box very cheaply. A box about 8 or 10 inches square is used. Cut out two thirds of the back of the box and gum on some tiffany. You also cut out two thirds of the lid and gum on some cellophane. The box stands up on one end and the lid is fixed with an elastic band or a piece of string looped and pulled down till it fits tightly.

Setting boards can be made from halsa wood. A groove to fit the body of the insect can be cut out and if the wood be sandpapered it will not be necessary to paper it. Ordinary setting boards are very dear to buy. The writer started his collection by cutting grooves in one of the old-fashioned sixpeny knifeboards.

For rearing young larvae from the egg, any ordinary small tin can be used. The bottom can be cut out and thick cellophane put in. The lid can likewise be partly cut out, and the finest perforated zinc substituted. The use of cellophane obviates the danger of injury from broken glass.

On *Erebia aquitania* Fruhstorfer : with a note on the value of anatomical characters in this and related species

By B. C. S. WARREN, F.R.E.S.

When I first separated *Erebia aquitania* as a distinct species (1955), my data were incomplete and I gave no illustration of its anatomical characters: it is hoped the present paper will make good these deficiencies.

Distribution.—*E. aquitania*, described from the southern Alps, is widely distributed throughout the Cottian and Maritime Alps and extends south into the Etruscan Apennines. It is a dark race very similar to *E. neleus murina* on the upper side, often with large black spots, but these can frequently be much reduced. The wings are somewhat pointed, but specimens with rounded wings also occur, in some localities

EXPLANATION OF PLATE.

All photographs $\times 18$, unless otherwise stated. This magnification is identical to that of the photographs in most works by the author, including the Monograph of the genus. Comparisons can therefore be relied on. Comparisons between figures of varying magnifications are often most misleading.

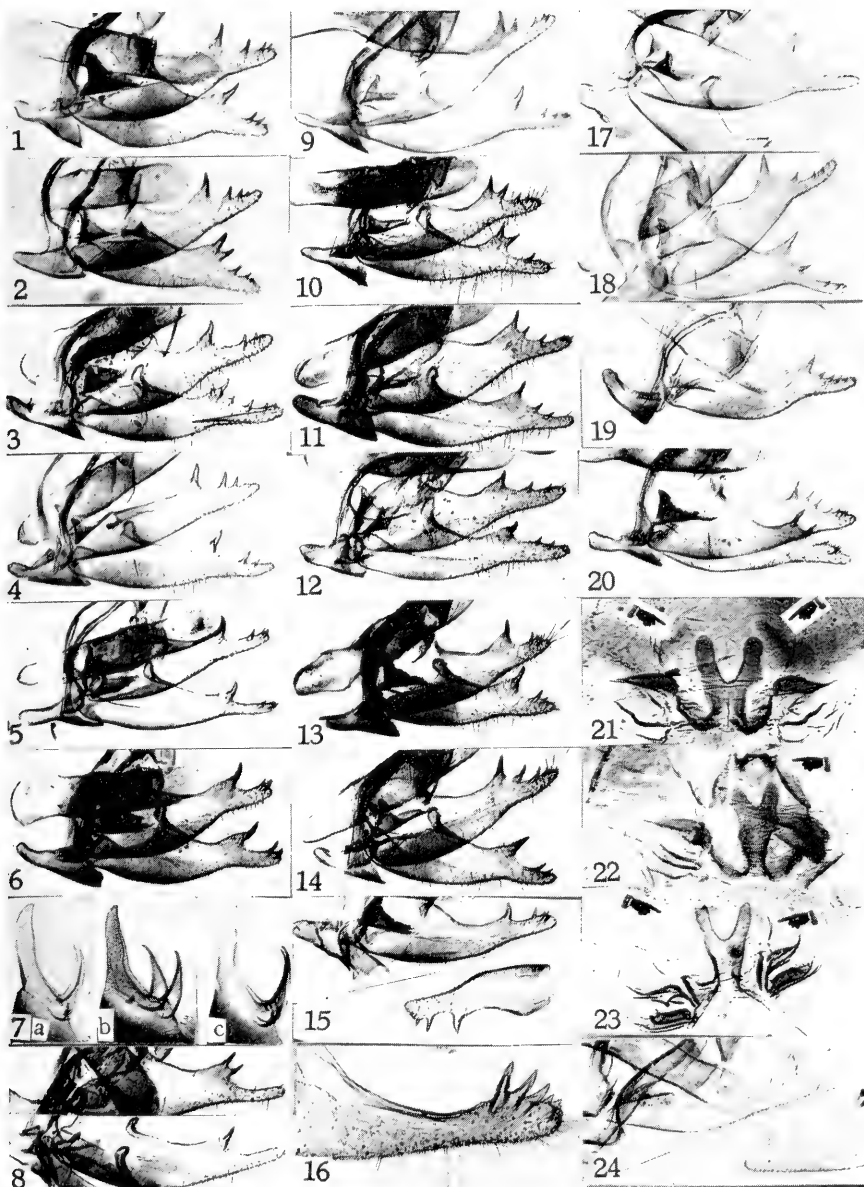
Erebia aquitania aquitania.

1. La Bessée, Cottian Alps.
2. Col di Sestrières, Cottian Alps.
3. Col de Vars, Cottian Alps.
4. Col di Sestrières, Cottian Alps.
5. S. Véran, Cottian Alps.
6. Seyne, Maritime Alps.
7. (a) *E. aquitania aquitania* f. *dolomitensis*, Glockner district.
- (b) *E. cassioides*, Glockner district.
- (c) *E. aquitania aquitania*, La Bessée, Cottian Alps.
8. *E. calcarius*, Julian Alps.
9. *E. aquitania aquitania*, Pertisau district; North Tyrol Limestone Alps.

E. aquitania aquitania f. *dolomitensis*.

10. Lienz district, Dolomites.
- 11, 12, and 13. Cisles Tal, Dolomites.
14. Karawanken Alps.
15. *E. aquitania macedonica*, Rhodope Mountains.
16. *E. callias sheljuzhkoii*, Teberda, Caucasus. (Magnified $\times 42$.)
17. *E. neleus neleus*, Retezat Mountains, Transylvanian Alps.
18. *E. neleus murina*, Lac de Gaube, Pyrenees.
19. *E. tyndarus semimurina*, Mte. Baldo, Lake of Garda.
20. *E. tyndarus* (aberration), North Tyrol Limestone Alps.
21. *E. cassioides campestris*, Mallnitz, Carinthia.
22. *E. cassioides campestris*, Jamnig Alp, Mallnitz, Carinthia.
23. *E. tyndarus*, Simplon Pass.
24. *E. dromulus graucasica*, Teberda, Caucasus.

as recurring aberrations, when they bear considerable resemblance to *E. tyndarus*. The marking of the under side of the hindwing is also suggestive of that species, but often browner in colour. *E. aquitania* extends north into the Graian Alps, but how far is uncertain; after a gap, which may well only be in our knowledge, it reappears in the Tridentine Alps (= race *dolomitensis* Warren in part, 1936). Both the round and pointed wing-formations are frequent in this area also, and so marked is this that von Mentzer, on the strength of a few specimens, was led to suppose the round-winged form to be a different species



(1958). The black spots, extent of coloured markings and size of the insect all vary endlessly. von Mentzer notes (*l.c.*) that Dr. C. Taccani took a female *E. tyndarus* on Mte. Spinale, the locality of von Mentzer's *E. aquitania*. This is the most southerly point as yet recorded where the two species meet, but there are probably others in the district as *E. tyndarus* has passed some way further south to Mte. Baldo. From the Tridentine Alps *E. aquitania* extends east throughout the Dolomite Alps and north to the Oetzal Alps, where it again occurs in proximity to *E. tyndarus*; the latter is recorded in the Rofen Tal and *E. aquitania* (as "*cassioides*") in the Nieder Tal (Lorkovic, 1958, p. 322). *E. tyndarus* also occurs in the next parallel valley, the Gurgltal. This record of proximity, taken with von Mentzer's, is proof that *E. aquitania* and *E. tyndarus* are specifically distinct. Still further north *E. aquitania* reappears in the North Tyrol Limestone Alps. Eastwards in the Dolomites and beyond in the Lienz Dolomites it develops a racial form, and as in 1936 I had not realized that *E. aquitania* extended throughout the Dolomites, I then included both in my description of race *dolomitensis*. The latter name must therefore be restricted to the more eastern form, as:—

E. aquitania aquitania f. *dolomitensis*. The principle characteristic of this form is the dark underside of the hindwing in the male, the basal and median bands are united into a single black-brown area, the antimarginal band is sharp but paler grey, the outer or marginal band very prominent of the same dark colour as the basal area. The coloured markings on the upperside are on the whole slightly brighter and sharper than in the nominate race. I take the specimens from the neighbourhood of Lienz, taken by the late Mr. F. B. Welch, as types of *dolomitensis*, as they are the most pronounced examples of the form I have seen. This form occurs in single specimens among race *aquitania* in most of the Dolomite area. I have them from the Karer Pass and Cises Tal, a lateral valley of the Grödner Tal, the race of the Cises Tal being a remarkable transition between the two extremes. The form *dolomitensis* extends eastwards to the eastern end of the Karawanken Alps. Northwards it occurs in a paler form in the Hohe Tauern range, where it flies with *E. cassioides* (Hohen. in part, Warren, 1936) in several localities. Like the latter insect, *dolomitensis* is at its finest at the lowest levels, and loses size and colour as it ascends to the highest, between 8,000 and 9,000 feet, where it reverts to a form somewhat similar to *aquitania*, which has probably often been mistaken for *E. cassioides*. To the south-west I do not know what form exists in the mountains bordering the Pustertal, but the race here would probably be a transitional one. It is interesting to note that the subspecies *campestris* of *E. cassioides* is present in this district. Westwards, f. *dolomitensis* ranges to the Stubay Alps and north to the North Tyrol Limestone Alps, but most of the specimens I have seen from these districts are smaller, but still dark in colour, though on the underside of the hindwings the bands are much less distinctly marked. Some hundreds of miles south from the Karawanken Alps, two more, large and strongly spotted races of *E. aquitania* occur; the subsp. *illyrica* and *macedonica*. The distributional range of the species, therefore, extends in a great arc from the central Balkans to northern Italy, via the southern side of the Alps; only in one area of Austria has it ex-

tended northwards. It is possible that the race *arvernensis* Obth. may prove to be a form of *E. aquitania* that has attained its most westerly locality in the Auvergne mountains. Adequate material is not available to decide the question at present.

Genitalia.—In the species of the *tyndarus*-group the male claspers provide the best characters; which are: (1) the length of the head; (2) the formation of the head; (3) the degree of the shoulder elevation; (4) the spine system. In all *Erebia* the latter is of primary importance. These features are variable, and cannot be estimated by measurements or diagrammatically. The complete varietal range must be recognized. One variety must be mentioned, for it probably occurs in all species. In this the head of the clasper, no matter what its normal form, is greatly expanded, causing the head at its junction with the body to be double its normal width (depth), and the spines often increase in size and number. Fig. 20 shows an example of this aberration in *E. tyndarus*, but though the normal appearance is changed, the spine system is not. The minute needle-point spines close to the extremity, the range of spines along the dorsal ridge, variable in number but increasing in size to the shoulder, are characteristic of the species. Normally there are not so many of the needle points, and they are often difficult to see if the clasper is not mounted in true profile. Thus in fig. 19, a typical specimen, they are only indicated by the darker outline of the termination of the head. I illustrated a good example of this aberration in *E. neleus murina* (1936, fig. 429), a species in which it would not be expected, but I have it from several localities. These structural aberrations are of no more consequence than marked superficial aberrations, and should be disregarded in systematic work.

In *E. aquitania* the normal varietal range is considerable. Figs. 1, 4, 9, 13 and 14 are typical examples. The head is short, expanding from the tip to the body, the dorsal ridge attaining the level of the base of the shoulder spine without any abrupt, vertical rise. There are two or three moderately strong spines located near the termination, the proximal one the largest, and there is most often a gap without spines between it and the shoulder spine. There is a marked tendency for asymmetrical development of these spines, the largest one on the head being moved proxad on the right clasper, as in figs. 1, 4, 9 and 14; this is rare on the left clasper. The shoulder elevation is slight, or non-existent. Occasionally, as figs. 4 and 12, the spines are more spread out as in *E. tyndarus*, and one of the two terminal ones is lost, but the depth of the head and the absence of the minute, terminal, needle-point spines, distinguish it from the latter. The most advanced development of the *aquitania*-type, is shown in fig. 6; clearly drawing away from the types of all other species; a link with the remarkable development of *E. epistygne* as I noted (1955, p. 255). My inclusion of the latter in the "B" section of the *pluto*-group (i.e. the *tyndarus* section), has been rejected as absurd by some who have never studied the *aquitania* structures in detail. Another variation is seen in figs. 3 and 10. In this the shoulder spine is double on the left clasper, and there is some increase in extent of the shoulder rise on both. This variation has, mistakenly, been held to connect *E. aquitania* with the *E. neleus* races but the expanding head and the spine system disprove this idea. The double shoulder spine can occasionally appear on the right clasper also. Even

at the extreme eastern limit of the range of *f. dolomitensis* the spine system is that normal to the species: compare figs. 14 and 1, showing the characteristic asymmetrical spine development; or figs. 2 and 10. The transitional race of the Cisles Tal, which produces typical race *aquitania* and the darkest *f. dolomitana* and a chain of intermediate forms, also gives a remarkable range of structural forms: fig. 11, with considerable shoulder development; fig. 12, a more *tyndarus*-like type; and fig. 13, with the blunted termination more frequent in race *macedonica* (fig. 15). Both the extremes seen in figs. 11 and 12, appear in western *aquitania*, figs. 2 and 4. The completely blunt termination of the left clasper in fig. 15 is an asymmetrical development most often affecting the left clasper in that race. With the more accurate knowledge of structural character in *E. aquitania*, it is probable that it will be possible to distinguish the clasper characters of *E. cassioides*, which I did not think could be done in 1955. It is outside the range of this paper to go into this question, but I may mention the uncus in these species. It is said that in *E. cassioides* the uncus and brachia are longer and narrower than in *E. aquitania*. This is often so, but often it is not. A glance at fig. 7 will show this: (a) *f. dolomitensis*, (b) *E. cassioides*, specimens taken together; (c) *E. aquitania* from the south. The much greater depth of the brachia in b, is as marked as the short uncus. It may be noted that the term "subuncus", often incorrectly used for the brachia, was first applied by Chapman to processes mostly found in the Heterocera, only known in the Rhopalocera in a few HesperIIDae (see Warren, 1957).

The female genitalia.—It is now recognized that *E. cassioides* is the only species in this group in which the female structures are of any systematic value; but there are still some mistaken ideas on the subject. In every species the rim of the proximal edge of the 8th sternum tends to be sclerotized, often strongly so at the sides and often producing a ventral sclerite that may be angled or curved. Fig. 21 shows the lateral bands of sclerotization (dark), and a central, membranous break, partly bridged by extensions of sclerotization from the sides (marked by pointers). This is a frequent form in *E. cassioides*, but the extensions can be longer on one side and reduced on the other. The membranous gap distinguishes *E. cassioides* in a majority of cases, but as shown in fig. 22, the central sclerite can occasionally be fully developed (marked by pointer). I recorded this specimen (1955, p. 253), and to prevent mistake as to its appearance cited a figure of a similar example of *f. dolomitensis* (1953, Supp. plate, fig. 19). Recently, however, Lorkovic stated again that "no such females were found in nature" (1958, p. 322), and that "females can always be determined unequivocally" by the absence of the ventral sclerite (*l.c.*, p. 321). There is no reason to suppose my specimen is a natural hybrid, the rarity of hybrid females is known and there was nothing to suggest the males taken with it were hybrids. But in structures of such variability it would be surprising if this very usual form in other species, did not appear at times in *E. cassioides*, especially as the lateral sclerotization of the sternum is often stronger in this species than others. Further, the ventral sclerite can be reduced or lost in other species, as fig. 23, where it is replaced by a scarcely visible fragmentary film of sclerites alternating with membranous patches along the rim of the sternum.

With the separation of the *E. aquitania* races the *neleus* races can no longer be connected with any other specific race-group. The long, narrow, linear (parallel-sided) head, bearing 2 to 4 small, separated spines and the abrupt, vertical rise to the shoulder which is located centrally owing to the length of the head, all render the claspers unmistakable. These characters are constant throughout the great range of the species which extends from the Transylvanian Alps (nominate race, fig. 17), via the northern side of the Alps, as race *murina* in the Bernese Alps, and Alps of the Vaud and Valais and far south into the Savoy, attaining the Pyrenees (fig. 18) and the Cantabrians. There is the usual local variation, especially in some offshoots, but this cannot be dealt with now. *E. neleus* and *E. aquitania* have not as yet been found in proximity, but there are two areas where this may be expected and time will probably bring the desired information: just as my first record of the race *murina* in the Grindelwald valley (1954) established its specific distinction from *E. tyndarus*, the latter having been taken in numerous localities on the inner slopes of that curious, trough-like valley by many collectors. In the meantime the anatomical differences are such that the fact cannot be doubted.

The separation of *E. aquitania* probably justifies the separation of *E. calcarius* as a species also. The claspers (fig. 8) are of the *neleus* type, but the head is mostly quite without spines (as in the figures which are from two specimens), or there may be one or two which are stronger than those in *E. neleus*. The shoulder rise is not so pronounced. These characters support the slight difference of 2, in the number of the chromosomes. Aberrations of the distended head type (previously described) have been mistaken as suggesting affinity between *calcarius* and *E. tyndarus*, but of course there never is the slightest resemblance between the spine systems of the two species.

The value of anatomical character.—It may seem unnecessary to comment on this; for is not structural form the basis on which all zoological order rests? But doubts have been raised as to the value of the characters of the genitalia in the *tyndarus*-group species. It is, therefore, of interest to note that the three most widely distributed central European species, *E. tyndarus*, *E. aquitania* and *E. neleus*, are, as has been shown, unmistakable by their genitalia but they cannot be distinguished by the chromosomes; the number is the same in each. *E. dromulus* and *E. iranica* are another pair of species in which structure will have to be the criterion. I separated *E. callias* as distinct, on structural character, but just before the publication of my Monograph, Sheljuzhko's discovery of a race of *E. callias* flying together with *E. dromulus* in the Caucasus, confirmed my action. de Lesse recently recorded the chromosome numbers as 15 in *E. callias* and 51 in *E. dromulus* and *E. iranica*. Having only one specimen of the latter in 1936, which seemed closer to *E. callias*, I could not separate it. A series will be necessary to establish the range of structural character in *E. iranica*, but judging from the clasper variation known in *E. dromulus* it is likely the former will prove to be distinct. According to Lorkovic (1958), *E. callias* is confined to Colorado. As he did not mention its Siberian races, some of which are indistinguishable from Colorado specimens by any means, or Sheljuzhko's discovery, I added fig. 16, a typical clasper of *E. callias sheljuzhkoi*, and fig. 24, the claspers of a single specimen of *E. dromulus graucasica*, both taken on

the same ground in the Caucasus. (Fig. 16, is $\times 42$.) The oval head and absence of any shoulder in fig. 16 are typical of *E. callias*. There is considerable variation in both species, and in *E. dromulus* every intermediate formation between the two claspers shown can occur. With the separation of species anatomical characterization in this group is becoming clearer, and no worker can ignore it without detriment to his work. My own failure to examine an extended series of the Dolomite insects is a case in point. I should have paid more attention to the fact that Schawerda, who was an expert both on Erebias and the Dolomite region, always referred to the insect as "*E. tyndarus* Esp." (1924), with which species *E. aquitania* has considerable affinity. Confirmation of the specific unity of the extreme eastern (Balkan) and western races of *E. aquitania* has been obtained by Lorkovic's breeding experiments. He crossed the Balkan race *illyrica* with what he called "*Alpine cassioides*". Judging from the diagram he gave (1958, p. 324, fig. 4), it is certain that the "*Alpine cassioides*" came from the eastern Alps, and must therefore have been either *E. aquitania aquitania* or the f. *dolomitensis*; but it makes no difference which. The cross bred true in every way, incontestably confirming my action uniting *illyrica* and *aquitania* as conspecific; but obviously it had no bearing on the question of specific separation of *E. aquitania* from *E. tyndarus* or *E. neleus*. Lorkovic, however, claimed it proved my views on both these points "untenable" (1958, p. 324), which shows the vital necessity for accurate identification by anatomical characters of both races concerned in such experiments, if deductions based on the data derived are to be reliable. In view of the numerous synonyms that have been used the following check list of the species dealt with may be useful.

E. tyndarus (Esp.).

subsp. *tyndarus* (Esp.); f. *alpyaica* Lorkovic.

subsp. *semimurina* Warren.

E. aquitania Frhst.

subsp. *aquitania* Frhst. (= *subcassioides* Vty.; *maritima* Testou; *tusca* Vty.; *dolomitana* Goltz; *dolomitensis* Warren in part; *tyndarus* Schawerda nec Esp.; *cassioides* Lorkovic nec Hohenwarth, in part; *tridentina* v. Mentzer).

form *dolomitensis* Warren (= *cassioides* Lorkovic in part).

(?) subsp. *arvernensis* Obth.

subsp. *macedonica* Buresch.

subsp. *illyrica* Lorkovic; f. *illyromacedonica* Lorkovic.

E. cassioides (Hohenwarth).

subsp. *cassioides* (Hohn.) in part; Warren, 1936 (= *nivalis* Lorkovic and de Lesse, 1954).

subsp. *campestris* Warren.

subsp. *warreniana* de Lesse.

E. neleus (Freyer) (= *cassioides* Lorkovic nec. Hohn. in part).

subsp. *neleus* (Freyer) (= *transylvaniensis* Warren).

subsp. *murina* Rev.

form *carmentis* Frhst. (= *cassioides* Rev. nec. Hohn.).

subsp. *majellana* Frhst.

E. calcarius Lorkovic.

E. dromulus Stg.

subsp. *dromulus* Stg.

subsp. *graucasica* Jachontov. (= *hippocoon* Nies.).

E. transcaucasica Warren (? species).

E. iranica Gr.-Gr.

E. callias Edw.

subsp. *callias* Edw.

subsp. *sibirica* Stg.

form *simulata* Warren.

subsp. *altajana* Stg.

subsp. *sheljuzhkoii* Warren (= *dromulus* Nies. nec Stg.).

The synonyms given date from 1908; between 1799 and 1893, those authors who mentioned "*cassioides*" connected it with almost every European *tyndarus*-like race known to them; with round or pointed wings; even *E. tyndarus* and its race *semimurina*. Without the locality given in the original description, "*cassioides*" must have been a nomen nudum; the description would cover any "*tyndarus*" insect, and the figure was useless; the conflicting efforts of past authors testify to this. The form *dolomitensis*, as described, merges with subsp. *aquitania* when the two meet. A form of a subspecies is a category not recognized in the rules of nomenclature. The name "*cassioides*" cannot be used to cover the nominate race of *aquitania*; for the latter does not exist in the Glockner district. It follows, that as a name validly published and having priority, cannot be disregarded, "*cassioides* Hohn." can only be employed in the sense in which I first used it. To attach it to the form *dolomitensis* of subsp. *aquitania* would be tantamount to placing it in synonymy. The name *dolomitensis* only comes into use because it was described as covering the insects of the Dolomite region as a whole; therefore the correct identification of the nominate race of *E. aquitania* restricted it to the fluctuating local form. *E. cassioides* Hohn. therefore stands for the nominate race of the indigenous species of the Glockner and Hohe Tauern region. The impossible combination of uses shown in the above synonymy can, fortunately, be left there.

REFERENCES.

- Lorkovic, Z. 1958. Some Peculiarities of Spatially and sexually Restricted Gene Exchange in the *Erebia tyndarus* group. *Cold Spring Harbor Symposium on Quantitative Biology*, **23**: 319-325.
- Lorkovic, Z. et de Lesse, H. 1954. Nouvelles décoyvertes concernant le degré de parenté d' *Erebia tyndarus* Esp. et *E. cassioides* Hohn. *Lambillionea*, **54**: 58-68, 78-86.
- v. Mentzer, E. 1958. *Erebia calcarius* Lork. subsp. *tridentina* subsp. nov. *Entomol. Ts.*, **79**: 6-10.
- Schawerda, K. 1934. Fauna Dolomitana. *Mitt. Münch. ent. Ges.*, **14**: 73-119.
- Warren, B. C. S. 1936. Monograph of the Genus *Erebia*.
- 1953. Problems of speciation in the Genus *Erebia*. *Ent. Rec.*, **65**: Supp. 2-6.
- 1954. *Erebia tyndarus* Esp. and *E. cassioides* Hohn. two distinct species. *Ent. Monthly Mag.*, **90**: 129-131.
- 1955. *Erebia tyndarus* and allied species: the solution of some long outstanding problems. *Entom.*, **88**: 227-231, 252-259.
- 1957. Hitherto overlooked anatomical data concerning the genital structures in the Rhopalocera. *Trans R. ent. Soc. Lond.*, **109**: 361-377.

Current Literature

KEY TO THE NAMES OF BRITISH BUTTERFLIES AND MOTHS, by R. D. Macleod (Pitman, 15/-). The author points out in his introductory note that it is more than one hundred years since the last book of this nature, *An Accentuated List of the British Lepidoptera* was published

in 1856, and that since then, a very large number of the names have been changed, and several insects have been added to the British list. These notes cover the subject from many angles reasonably simply and certainly in a way to stimulate interest, and while the author holds his candle to the devil of popular names, he does so in order that the student may be made aware of the uselessness of these names, and be weaned from them to the universally understood scientific names.

The actual list of names is divided into List I, divided into butterflies, macro-moths and micro-moths, which lists the genera alphabetically, in each section, and the species alphabetically under the genera, thus wisely aiming a blow at the bad habit, so widely practised, of using only the trivial name, and List II, similarly divided, explaining certain of the popular names. The author has consulted wisely and worked diligently to make this list as accurate as possible although possibly a few of his definitions may be considered matters of opinion. The great point is that this book should stimulate beginners into taking an intelligent interest in the proper nomenclature, and it will certainly add interest to the more seasoned entomologist.

The increasing number of professional openings in entomology is attracting more and more young people to serious study, and for them this book will definitely be of the greatest value by easing them into the use of scientific names in these days when, unfortunately, the classical languages are taught less and less, and the author is to be especially congratulated on having transcribed the Greek words into Roman letters; the first time we have seen this aid to those without knowledge of the Greek language.—S. N. A. J.

The Diptera about Dale Fort Field Centre, Pembrokeshire

By L. PARMENTER.

(Concluded from p. 160)

VISITORS TO FLOWERS

The diptera visiting 23 species of flowers found about Dale are listed below. There was rarely any time to concentrate on this aspect. Half an hour was spent watching and collecting samples of the species appearing on a clump of fennel. The constant bustling activity prevented any counting of the individuals of each species. On another morning, when the day was cooler and damper, a head of *Angelica* was watched for a few minutes. My diary notes read:—

A.M.

10.8 Overcast. On one head of *Angelica* were

- 1 ♂ 1 ♀ *Eristalis pertinax*
- 2 ♀ ♀ *Chrysogaster solstitialis*
- 3 ♀ ♀ *Morellia* sp.
- 1 ♀ *Syrphus laternarius*

and a sawfly *Tenthredo* sp.

10.9 Sun comes out. Sawfly tubed. *E. pertinax* departs. *S. laternarius* occasionally takes off and returns, two flights in one minute. The other flies work steadily over the flowerhead.

10.10 Another *S. laternarius* arrives. Both depart.

- 10.11 Three small hemiptera and a bee arrive, the latter I remove. 1 ♂ *E. pertinax* arrives, flits at times and works over the flower, bobbing its tail.
- 10.13 2 ♀♀ *S. laternarius* arrive. 1 ♀ *Cheilosia illustrata* arrives. It is now bright sunshine with no wind.
- 10.15 Another *S. laternarius* arrives. All three of this species are taking pollen and nectar in turn.
- 10.17 A fourth *S. laternarius* and an *Eristalis pertinax* arrives.
- 10.19 A large Tachinid—*Ernestia radicum* arrives and bustles about. All the other insects depart. The Tachinid flies off and two ♀♀ *S. laternarius* and the three *Morellia* ♀♀ return.
- 10.20 An *E. pertinax* arrives and leaves as I capture a *Limnophora triangula* which had just landed.

This short spell illustrated the constant change in the population of a flowerhead and the effect of one fly on others. Comparing one head of *Angelica* with another, showed that the numbers per head varied considerably. It appeared that approaching flies were more attracted to the head with a large group of flies already present than to one with a few or less. The supply of pollen and nectar at a flowerhead cannot be endless but it was noted that one flowerhead of hogweed at Castle Beach retained its attraction for *Cheilosia illustrata* for ten days.

The nomenclature used in the following list is:—

Plants. Flora of the British Isles. A. R. Clapham, T. G. Tutin and E. F. Warburg, 1952.

Diptera. A Check List of British Insects. G. S. Kloet and W. D. Hincks, 1945, but amended for the families included in the Royal Entomological Society's Handbooks and in the monographs of Mr. J. E. Collin since 1945, to 1958.

ABBREVIATIONS

- Ach. m.* = *Achillea millefolium* L. Yarrow.
- Ang. s.* = *Angelica sylvestris* L. Wild Angelica.
- Arc. m.* = *Arctium minus* (Hill) Bernh. Lesser Burdock.
- A. tri.* = *Aster tripolium* L. Sea Aster.
- Cent. n.* = *Centaurea nigra* L. Knapweed.
- Cir. ar.* = *Cirsium arvense* (L.) Scop. Creeping Thistle.
- Cir. v.* = *Cirsium vulgare* (Savi) Ten. Spear Thistle.
- C. cap.* = *Crepis capillaris* (L.) Wallr. Smooth Hawk's-beard.
- D. car.* = *Daucus carota* L. Wild Carrot.
- Eup. ca.* = *Eupatorium cannabinum* L. Hemp Agrimony.
- Foen. v.* = *Foeniculum vulgare* Mill. Fennel.
- Ger. rob.* = *Geranium robertianum* L. Herb Robert.
- Herc. s.* = *Heracleum sphondylium* L. Hogweed or Cow Parsnip.
- Lim. v.* = *Limonium vulgare* Mill. Sea Lavender.
- Mat. m.* = *Matricaria maritima* L. Scentless Mayweed.
- Mel. rub.* = *Melandrium rubrum* (Weig.) Garcke. Red Campion.
- Pot. ans.* = *Potentilla anserina* L. Silverweed.
- Rub. fru.* = *Rubus fruticosus* L. agg. Bramble.
- Sen. j.* = *Senecio jacobaea* L. Ragwort.
- Sen. syl.* = *Senecio sylvaticus* L. Wood Groundsel.

Son. ar. = *Sonchus arvensis* L. Sow-Thistle.

Sus. p. = *Succisa pratensis* Moench. Devil's-bit Scabious.

Tor. jap. = *Torilis japonica* (Houtt) DC. Upright Hedge Parsley.

BIBIONIDAE

Dilophus febrilis L. at *Foeniculum vulgare*.

MYCETOPHILIDAE

Sciara thomae L. at *Foeniculum vulgare* and *Heracleum sphondylium*.

STRATIOMYIDAE

Chloromyia formosa Scop. at *Heracleum sphondylium*.

EMPIDIDAE

Platypalpus minutus Mg. at *Torilis japonica*.

Hybos culiciformis F. at *Torilis japonica*.

Empis livida L. at *Aster tripolium*.

E. aestiva Lw. at *Senecio jacobaea*.

Rhamphomyia variabilis Fln. at Ang. s., Sen. j., Ach. m., and Cir. ar.

DOLICHOPODIDAE

Dolichopus nubilus Mg. at *Aster tripolium*.

Hercostomus germanus Wied. at *Daucus carota*.

H. nigripennis Fln. at Rub. fru., Pot. ans., Tor. jap., D. car., C. cap.

Chrysotus neglectus Wied. at *Torilis japonica*.

C. gramineus Fln. at *Torilis japonica*.

PHORIDAE

Phora aterrima F. at *Torilis japonica* and *Aster tripolium*.

Conicera atra Mg. at *Foeniculum vulgare* and *Heracleum sphondylium*.

SYRPHIDAE

Paragus tibialis Latr. at A. tri., Mat. m., and C. cap.

Pyrophaea granditarsa Forst. at *Foeniculum vulgare*.

Platycheirus manicatus Mg. at Rub. fru., Herc. s., Lim. v., Sus. p., Sen. j., A. tri., Cir. v., Cir. ar., Son. ar.

P. scutatus Mg. at *Heracleum sphondylium*.

P. albimanus F. at *Heracleum sphondylium* and *Senecio jacobaea*.

Melanostoma scalare F. at *Cirsium arvense*.

M. mellinum L. at *Sonchus arvensis* L.

Sphaerophoria rueppellii Wied. at *Aster tripolium*.

S. scripta L. at *Limonium vulgare* and *Aster tripolium*.

S. menthastri L. at *Heracleum sphondylium*.

Scaeva selenitica Mg. at *Foeniculum vulgare*.

S. pyrastris L. at Rub. fru., Foen. v., and Mat. m.

Syrphus glaucius L. at Rub. fru., Tor. jap., Ang. s. and Herc. s.

S. laternarius Muell. at Tor. jap., Ang. s. and Herc. s.

S. torvus O.S. at Foen. v., Ang. s., and Herc. s.

S. vitripennis Mg. at Tor. jap., Foen. v., Ang. s., D. car. and Son. ar.

S. ribesii L. at Rub. fru., Foen. v., Ang. s., Sen. j., Arc. m., Cir. ar. and Son. ar.

- S. albostratus* Fln. at *Foeniculum vulgare*.
S. grossulariae Mg. at *Angelica sylvestris*.
S. tricinetus Fln. at *Arctium minus*.
S. corollae F. at *Aster tripolium* and *Matricaria maritima*.
S. luniger Mg. at *Arctium minus* and *Matricaria maritima*.
S. balteatus Deg. at *Foeniculum vulgare* and *Heracleum sphondylium*.
S. cinctellus Zett. at *Angelica sylvestris* and *Heracleum sphondylium*.
S. umbellatarum F. at *Torilis japonica*, *Foen. v.* and *Herc. s.*
Chrysotoxum bicinctum L. at *Foeniculum vulgare* and *Achillea millefolium*.
Rhingia campestris Mg. at *Mel. rub.*, *Ger. rob.* and *Cent. n.*
Ferdinandea cuprea Scop. at *Heracleum sphondylium*.
Chrysogaster soltitalis Fln. at *Rub. fru.*, *Tor. jap.*, *Ang. s.* and *Herc. s.*
Neoscia podagrica F. at *Pot. ans.*, *Tor. jap.* and *C. cap.*
Pipiza bimaculata Mg. at *Foeniculum vulgare*.
Cheilosia illustrata Har. at *Tor. jap.*, *Ang. s.* and *Herc. s.*
C. variabilis Panz. at *Daucus carota*.
C. paganus Mg. at *Torilis japonica*.
C. proxima Zett. at *Torilis japonica* and *Foeniculum vulgare*.
Sericomyia silentis Har. at *Rubus fruticosus* and *Angelica sylvestris*.
Eristalis aeneus Scop. at *Limonium vulgare*.
E. pertinax Scop. at *Rub. fru.*, *Ang. s.*, *Sen. j.*, *Eup. ca.*, *Mat. m.*, *Arc. m.*
E. tenax L. at *Rub. fru.*, *Sen. j.*, *Arc. m.* and *Cir. ar.*
E. horticola Deg. at *Matricaria maritima*.
Myiatropa florea L. at *Cirsium arvense*.
Syritta pipiens L. at *Rub. fru.*, *Tor. jap.*, *Foen. v.*, *Ang. s.*, *A. tri.*, *Ach. m.*, *Mat. m.*, *Cent. n.*
Eumerus strigatus Fln. at *Tor. jap.*, *Foen. v.*, *Ang. s.*, *A. tri.*, *Mat. m.*

CONOPIDAE

Sicus ferrugineus L. at *Cirsium vulgare*.

PIOPHILIDAE

Piophila vulgaris Fln. at *Foeniculum vulgare*.

TRYPETIDAE

Trypeta tussilaginis F. at *Cirsium arvense*.
Sphenella marginata Fln. at *Senecio sylvaticus*.

LONCHAEIDAE

Lonchaea flavidipennis Zett. at *Tor. jap.*, *Ang. s.* and *D. car.*

SEPSIDAE

Themira lucida Staeg. at *Angelica sylvestris*.

SCIOMYZIDAE

Limnia fumigata Scop. at *Cirsium arvense*.

SPHAEROCERIDAE

Paracollinella fontinalis Fln. at *Foeniculum vulgare*.
Thoracochaeta brachystoma Stenh. at *Heracleum sphondylium*.

DROSOPHILIDAE

Drosophila melanogaster Mg. at *Cirsium arvense*.

CHLOROPIDAE

Oscinella frit L. at *Foeniculum vulgare*.

Meromyza saltatrix L. at *Achillea millefolium*.

SCATOPHAGIDAE

Scatophaga stercoraria L. at *Foen. v.*, *Mat. m.* and *Cir. ar.*

S. litorea Fln. at *Aster tripolium*.

TACHINIDAE

Macquartia praefica Mg. at *Herc. s.*, *D. car.*, *Mat. m.* and *Cir. ar.*

Ernestia radicum F. at *Torilis japonica* and *Angelica sylvestris*.

Meigenia mutabilis Fln. at *Foeniculum vulgare*.

Actia pilipennis Fln. at *Heracleum sphondylium*.

Siphona geniculata Deg. at *Senecio jacobaea*.

Tachina larvarum L. at *Torilis japonica* and *Daucus carota*.

Epicampocera succincta Mg. at *Torilis japonica* and *Daucus carota*.

Zenillia vulgaris Fln. at *Torilis jap.*, *Foen. v.* and *Daucus carota*.

Eumea westermanni Zett. at *Torilis japonica*.

CALLIPHORIDAE

Brachycoma devia Fln. at *Angelica sylvestris*.

Sarcophaga nigriventris Mg. at *Cirsium arvense*.

S. crassimargo Pand. at *Foeniculum vulgare*.

S. scoparia Pand. at *Angelica sylvestris* and *Heracleum sphondylium*.

S. subvicina Rohd. at *Angelica sylvestris*.

S. carnaria L. at *Foeniculum vulgare* and *Aster tripolium*.

Pollenia rudis F. at *Foeniculum vulgare* and *Matricaria maritima*.

Phormia terrae-novae R.D. at *Foeniculum vulgare*.

Lucilia sericata Mg. at *Foeniculum vulgare*.

L. silvarum Mg. at *Aster tripolium*.

L. caesar L. at *Torilis japonica* and *Angelica sylvestris*.

Melinda anthracina Mg. at *Torilis japonica* and *Matricaria maritima*.

M. caerulea Mg. at *Torilis japonica*.

Onesia agilis Mg. at *Tor. jap.*, *Sen. j.*, *A. tri.*, *Mat. m.* and *Cir. ar.*

Calliphora erythrocephala Mg. at *Rubus fruticosus* and *Cirsium arvense*.

C. vomitoria L. at *Foeniculum vulgare* and *Angelica sylvestris*.

MUSCIDAE

Musca autumnalis Deg. at *Foen. v.*, *Ang. s.* and *Daucus carota*.

Orthellia caesarion Mg. at *Tor. jap.*, *Foen. v.*, *Ang. s.*, *A. tri.*, *Mat. m.* and *Cir. ar.*

Graphomyia maculata Scop. at *Rub. fru.*, *Tor. jap.*, *Foen. v.*, *Ang. s.* and *Herc. s.*

Mesembrina meridiana L. at *Foeniculum vulgare*.

Morellia aenescens R.D. at *Rub. fru.*, *Tor. jap.*, *Ang. s.*, *Herc. s.* and *D. car.*

M. hortorum Fln. at *Torilis japonica*.

Drymeia hamata Fln. at *Tor. jap.*, *Sen. j.*, *A. tri.* and *Cir. ar.*

Lophosceles cristatus Zett. at *Angelica sylvestris*.

Phaonia basalis Zett. at *Heracleum sphondylium*.

Fannia manicata Mg. at *Foeniculum vulgare*.

Limnophora triangulifera Zett. at *Torilis japonica* and *Angelica sylvestris*.

L. maculosa Mg. at *Heracleum sphondylium*.

Helina duplicata Mg. at *Tor. jap.*, *Foen. v.* and *Cir. ar.*

Hylemyia strenua R.D. at *Heracleum sphondylium*.

Pegohylemyia discreta Mg. at *Heracleum sphondylium*

Delia trichodactyla Rond. at *Cirsium arvense*.

D. intersecta Mg. at *Foeniculum vulgare*.

Nupedia dissecta Mg. at *Foen. v.*, *Herc. s.* and *Daucus carota*.

Anthomyia procellaris Rond. at *Foeniculum vulgare* and *Angelica sylvestris*.

Caricea tigrina F. at *Foeniculum vulgare*.

Oplogaster mollicula Flin. at *Cirsium arvense*.

SUMMARY

1. About 700 specimens of 255 species were collected about Dale Fort, Pembrokeshire, and notes were made of further specimens seen during a ten day visit in August.
2. The flies identified form a preliminary appreciation of the species present in August and are considered under the major habitats to give an idea of the zonation of distribution.
3. Special attention was made to the visitors to flowers, 118 species at 23 species of flowers. This appears to be an interesting method of ascertaining the reasons for certain distributions and of the habits of some species.
4. Besides the need for studies for each month, more intensive comparisons between the habits of related species in the varied range of habitats in this restricted area would seem profitable.

Editorial Note

The Editor apologises to readers for the delay with the present number, resulting from causes outside his control, and assures readers that the September number is well in hand, and should appear by 15th September as customary.

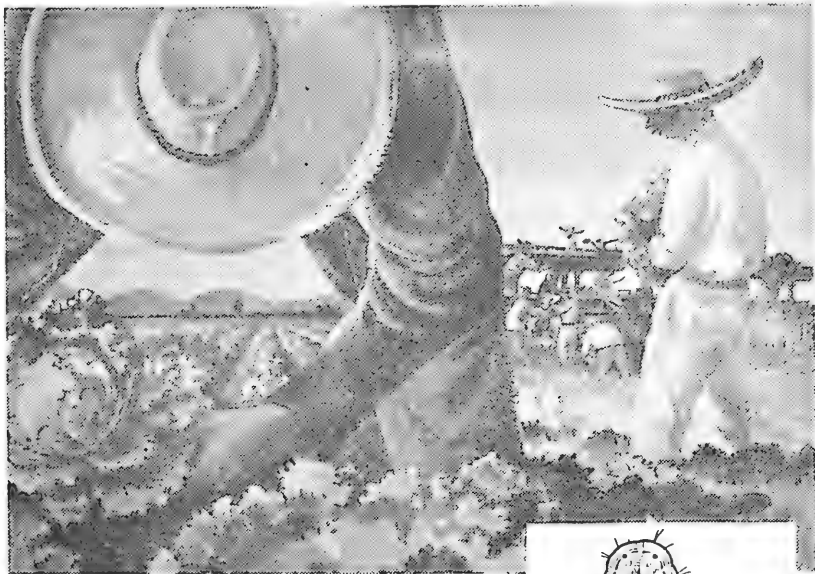
On August 3rd last, we regret to say that our contributor, A. W. Richards, M.A., B.Sc., died in the field. We hope to publish a suitable obituary notice shortly, and in the meantime offer our sincere regrets and sympathy to his family.—ED.

Green into Gold

In the Imperial and Salinas Valleys of California and the Salt River Valley of neighbouring Arizona, are grown both the best lettuce in the U.S.A. and the biggest commercial volume. Unfortunately, the constant heat, together with ample moisture from irrigation, provides ideal conditions for insect pests—particularly aphids and the cabbage looper, *Trichoplusia ni* (Hbn.). Infestation builds up throughout the season, sometimes increasing heavily just before harvest, and when this happens, the marketability of the crop is greatly reduced. Until recently, because of undesirable residues left on the leaves, there was no effective insecticide which could be used at this critical time.

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Trichoplusia ni (Hbn.). Cabbage looper

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THE ENTOMOLOGIST'S RECORD

AND JOURNAL OF VARIATION

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CLORINDA QUERCI

What at Witherslack?

By Dr. NEVILLE L. BIRKETT, F.R.E.S.

"Witherslack hath many charms,
Best of all is the Derby Arms".

So ran a little rhyme underneath a rather crude picture of moths which hung until recently in the lounge of the tavern mentioned. Who painted the picture, who wrote the verse and who first put them in the lounge I do not know—and should be glad if anybody can help me with information concerning the matter. But the presence of this work of art of some age indicates perhaps that Witherslack has been famous as an entomological centre for many years. Being resident near this famous locality I am often asked for information as to what can be obtained there and where and when to work the area and it is with a view to answering, perhaps only in part, some of these questions that the present note is being written.

"Witherslack" has appeared on data labels for many years and it is a little unfortunate that more specific data have not been given, because the area is fairly large and in it are many very varied habitats all lying within a few miles of the Derby Arms. The variety of habitats indeed is the principal reason for the area being one of such great entomological potential and for it having been so well worked in the past.

It is a matter for conjecture who first discovered the entomological possibilities of the area but one or two names stand out of workers during the last century who regularly and thoroughly worked at the lepidoptera of the district.

It was apparently visiting, rather than resident, entomologists who blazed the trail and foremost among them were J. B. Hodgkinson and J. H. Threlfall of Preston. In the last third of the 19th century they worked Witherslack persistently and well and much of this work is recorded in contemporary issues of the *Entomologist* and *Entomologist's Monthly Magazine*. By the turn of the century the area was well known and local collectors were taking an active part in exploring its possibilities so that we find the Kendal Entomological Society in 1901 producing a list of lepidoptera occurring within 20 miles of Kendal Town Hall including numerous records of insects occurring at Witherslack. Visiting entomologists still made it a venue and some of the names are famous. Perhaps mention should be made of Prof. J. J. Lister who knew the area well and wrote about it in the journals of his day. In 1919 he gave a fairly full account of a visit to Witherslack and of the, mainly, butterflies he took there. He worked particularly on *Plebejus argus* f. *masseyi* taking a long series from the Kent river mosses (i.e. Meathop and Foulshaw) as well as a similar series from the mosses bordering the river Leven. In the last twenty or thirty years many entomologists have come to Witherslack and found it good.

Witherslack comprises a fairly large parish rather than just a village. The famous Meathop Moss is not strictly in Witherslack but in the adjoining parish of Meathop and Ulpha. However, its proximity to Witherslack necessitates its inclusion in this note. The centre of the Witherslack area is some four miles from Levens Bridge (on the main A6 road to Carlisle and Scotland) and is reached along the Ulver-

ston road, A590. Most of the good collecting country, excluding mosses, lies to the north and west of A590. The river Winster, dividing Westmorland from Lancashire, marks the western boundary of Witherslack and to the east of this lies an area of mossland known as Nichols Moss, still westward the boundary between the peat moss and carboniferous limestone is marked out by the famous Black Tom's Lane—one of the choicest of the collecting localities. The carboniferous limestone forms two main masses running approximately north from the road A590; these are Yewbarrow (not to be confused with a Yew Barrow just behind Grange over Sands) and Whitbarrow. The former is a limestone hill about 400 feet high while the latter reaches 700 feet. Between the two ridges of limestone runs a delightful valley in which are situated Witherslack Hall and the Witherslack Woods. (Hell Moss is also here but there is no special Brimstone in the locality!) To the south of A590 lie the mosses bordering the Kent river estuary and its salt marshes. Meathop and Caterag Mosses together constitute a nature reserve under the care of the Society for the Promotion of Nature Reserves and not far away is the extensive area of Foulshaw Moss now in process of drainage and rapidly losing its characteristic features of flora and fauna. The efforts of the Society to preserve Meathop are very worthy in view of the great destruction of primeval mosses that has been taking place and continues actively at the present time.

It will be convenient to our purpose to deal with the main habitats in turn as follows:—The limestone areas, the mosses and the Witherslack Woods. Black Tom's Lane, comprising the best of two worlds, will receive special attention finally.

Yewbarrow and Whitbarrow Scars are typical of carboniferous limestone anywhere in this country. The summits consist of almost bare rock, often of pavement type, with a characteristic vegetation growing in fissures and cracks in the rock. Trees tend to be few in species and stunted due to the exposed nature of the localities. Yew, juniper and ash are the main trees. The sides of the barrows consist of steep and very rough scree slope with even scantier vegetation but at the foot of the screes occur woods of fairly dense nature and mixed consistency. The main rhopalocera to note from these limestone hills are *Aricia agestis* Schiff. which is common among the Rock Rose, *Polyommatus icarus* Rott. nicely varied, *Argynnis aglaia* L. which gives one good exercise on the open fell top. Of moths there are plenty, though little night work has been done on either Whitbarrow or Yewbarrow—both being difficult of access for the present *sine qua non* of night collecting—a generating outfit. The very similar Scout Scar, near Kendal, has had some attention devoted to it at night and has proved most interesting. Of day flying species mention should be made of *Parasemia plantaginis* L. which is common, *Phothedes captiuncula* Tr. again common and flying mainly in the late afternoon. This is a much sought after species by visiting collectors and is fortunately in good strength. *Procris geryon* Hbn. is very local indeed but does occur on both Whitbarrow and Yewbarrow. Among the junipers *Eupithecia sobrinata* Hbn. can frequently be taken in daylight but occurs in plenty at night. *Thera cognata* Thunb. is likewise to be obtained in due season. *Ammogrotis lucerneae* L. is frequent to light, *Stilbia*

anomala Haw. abundant and in good variety, *Colostygia olivata* Schf. and *C. salicata* Hbn. are common; *Anaitis plagiata* L. is common and, in the Kendal district, I have taken the very rare var. *nigrescens*.

In the woods at the foot of the limestone hills are to be found many of the woodland lepidoptera common throughout the country. Perhaps among the less common species may be mentioned *Discoloxia blomeri* Curt. and *Perizoma taeniata* Steph. Both these are very local—especially the latter which frequents the very densest parts of the woods and is not easy to search out.

Having now descended from the heights the woods about Wither-slack Hall itself may be considered. These woods have been well worked by many collectors and their chief treasures are well known. In the spring the willows are well worth working for many of the common *Orthosias* which occur in plentiful variety. More particularly the visitor is likely to want his series of *O. miniosa* and perhaps *O. gracilis*. A pinkish form of the latter is not very common. *Gypsitea leucographa* Schf. is also a prize to be taken commonly on the willows. The form occurring at Wither-slack seems to be less bright than that taken in Yorkshire at Bishop Wood. At the time of taking *leucographa* searching the ash saplings by the aid of a torch will reveal *Nothopteryx polycommata* Schf. in plenty. The species seems to show little variation in our district. *Abraxas sylvata* L. is a common species in these woods later in the season. The prominent ones are also fairly well represented—*Drymonia dodonaea* Schf., *Chaonia ruficornis* Hufn., *Pheosia tremula* Cl., *P. gnoma* Fab., *Notodonta ziczac* L., *N. anceps* Goze, *Pterostoma palpina* Cl. all being present.

The mosslands bordering Morecambe Bay are what Tansley describes as "raised bogs". This is highly descriptive as they are indeed areas of peat moss raised up above the surrounding land. With modern ideas and methods of drainage the surrounding areas are drying and, as a consequence, the water table is falling so that in the not far distant future these raised bogs will dry out. Within easy reach of Wither-slack is the Meathop and Caterag Mosses Nature Reserve. This area provides many of the insects characteristic of these mosses. The main vegetation consists of heather, birch, sweet gale, cotton grass and an increasing growth of pine. This vegetation compound provides the entomologist with nearly all the year round work. Early spring gives *Brephos parthenias* L. in plenty, the first really warm sunny day will bring out *Achlya flavicornis* L. which can be found at rest on the smaller birches. A little later *Saturnia pavonia* L. cavorts wildly over the heather while among the heather itself *Callophrys rubi* L. flits about. At about the time when numerous diptera emerge to plague the body of any who venture on the mosses the cream of the lepidoptera also appear. In the past the most sought after insect was undoubtedly *Plebeius argus* L. f. *masseyi*. This fine race appears now to be extinct and has not been seen for at least twenty years though looked for frequently. *Coenonympha tullia* Mull. is still very plentiful and of fine appearance. The form *philoxenus* Esper is the local race and is characterised in particular by the fine spotting of the undersides. To list the species occurring on the mosses in high summer would be tedious and the selection of names following is merely to give some idea of the scope available. All may be assumed to be reasonably common.

Diacrisia sannio L., *Carsia paludata* Thunb., *Eulype hastata* L., *Perconia strigillaria* Hbn., *Ematurga atomaria* L. (a curse in its commonness), *Bupalus piniaria* L., *Selidosema plumaria* Schf., *Sterrhia muricata* Hufn., *Anarta myrtili* L., *Lycophotia varia* Vill., *Drepana falcataria* L., *D. lacertinaria* L., *Lasiocampa quercus* f. *callunae*, *Odontesia carmelita* Esp., *Lophopteryx capucina* L., *Notodonta dromedarius* L., *Pheosia gnoma* Fab., *Harpyia furcula* Cl., *Geometra papilionaria* L., *Chlorissa viridata* L., etc. The micro-lepidopterist will also find more than enough to satisfy him—*Crambus margaritellus* Hbn., *Salebria fusca* Hw., *S. betulae* Goze., *Peronea rufana* Schiff. may be found among the Sweet Gale. But Meathop Moss would run to several notes on its own—I hope I have shown there is sufficient material there for it to be well worth while putting up with the trials due to Clegs and other biting diptera and the occasional slipping into a bog-hole up to the thighs in slimy peat!

Working from Meathop Moss towards the Kent estuary we come on to an extensive salt marsh where the micro-lepidopterist will want to get such things as *Crambus selasellus*, *C. tristellus*, *Bucculatrix maritima*, *Eupoecilia affinitana* and *Coleophora maritima*.

I have saved the best locality of the area for final consideration, viz:—Black Tom's Lane. This is a lane about one and a quarter miles long running slightly west of north from Caterag Cottage (situated near the filling station on A.590) to a point near Slate Hill Farm. I understand that the name is derived from an old stone breaker who used to work in the quarry along this lane but whether he really existed and what his real name was I have never been able to find out. At any rate among entomologists it will be a name to remember. It owes its special merit to the fact that to the west of the lane is peat-moss similar in character to Meathop itself while to the west rise low hills of carboniferous limestone. It forms in fact the junction between these two formations—so one takes insects from both types of habitat! On a good night in early July one can readily take a hundred species of macrolepidoptera plus a good number of micros also. Among the better species noted here, mention should perhaps be made of the following:—*Ordontesia carmelita* Esp., three species of *Drepana*, viz.:—*lacertinaria*, *binaria* and *falcataria*; *Euxoa tritici* (only taken once), *Actebia praecox* (again a single specimen only, presumably a wanderer from some more suitable habitat), *Amathes glareosa* in considerable variety, *Amathes agathina*, *Amathes castanea*, *Anaplectoides prasina*, *Polia tincta*—frequent and readily taken as larvae in the spring, *Hadena bombycina*, *Apatele leporina*, *A. alni*, *A. menyanthidis*, *Craniophora ligustri* (which must be looked upon as uncommon), *Hyppa rectilinea* (have only taken one of this species), *Celaena haworthii*, *Hydraecia lucens*, *Gortyna flavago*, *Eustrotia uncula*, *Plusia bractea*, *Geometra papilionaria*, *Epirrhoe galiata* of a form approaching the Scottish one, *Eulype hastata*, *Eupithecia tenuiata*, *E. nanata*, *E. goosensiata*, *E. sobrinata*, *E. pumilata*, *Venusia cambrica*, *Ligdia adustata*, *Bapta bimaculata*, *B. termerata*, *Ellopiia fasciaria*, *Deuteronomus erosaria*, *Bupalus piniaria*, *Selidosema plumaria*, *Perconia strigillaria*. Many scarce micros occur so that any collector visiting the area is likely to have both his hands and his setting boards full.

I have not attempted to give anything like a complete account of all

the lepidoptera to be taken in the Witherslack area but hope that I have indicated some of the attractions. As a further attraction, were I writing a travel agent's advertisement, I would mention that Witherslack is happily placed for visiting the Lake District and also for getting to such other collecting localities as Arnside, Holker Moss and the mountains where lives half the British species of the genus *Erebia*. Need I say more?

3 Thorny Hills, Kendal. 21st July 1959.

Butterflies in the Cranleigh District, 1959

By Major A. E. COLLIER

On January 17th, in an air temperature of 22° F. but in bright sunshine, I went out on the first of my annual walks in the local woods to check up on the position of *Thecla betulae* L. and of *Limenitis camilla* L.

It was a badly chosen day as the blackthorns were coated with ice, which could not be shaken off, and the eggs of *betulae* would have been invisible.

As I returned by a forest path I examined the honeysuckle but found only one hibernaculum of *L. camilla* from which, to my very great surprise, the larva had emerged and was sunning itself on the stem nearby, apparently indifferent to the intense cold.

Later in the month I found *betulae* eggs widely distributed in many localities but less numerous than usual.

The search for hibernacula of *L. camilla* continues to be very unrewarding, as it has been ever since 1952 when I first found so many of the young larvae parasitised by the unidentified Braconid of the genus *Meteorus* (*Ent. Rec.*, 65: 145) which appears to lay its single egg in the small larva in the autumn before hibernation. Two hours search in a Chiddingfold wood on April 10th produced 17 larvae, most of them still in their hibernacula. A few weeks later, when they had just reached the green stage, nine of them succumbed to this disastrous parasite. Early in April a visit to a favourite locality for *Apatura iris* L. revealed a devastated area covered with the remnants of over 150 large oak trees, and with certain willows, on which larvae had been seen in October, uprooted and crushed by the timber lorries.

Anthocharis cardamines L. was first seen on April 20th and from that date onwards I do not think that I saw as many as 20 on the wing. In spite of that, I had no difficulty in collecting 300 eggs from many different localities.

Pararge aegeria L. were in evidence in their usual strength from the 28th April and a hot spell in May brought out *Argynnis euphrosyne* L., and *Pyrgus malvae* L. on the 7th, *Coenonympha pamphilus* L. on the 9th, *Erynnis tages* L. on the 11th and *Leptidea sinapis* L. on the 12th. All the foregoing were in much smaller numbers than usual, and *A. euphrosyne* was particularly disappointing being virtually over by May 22nd. *Euphydryas aurinia* Rott., appeared earlier than usual on May 13th. It is now at its lowest ebb in those localities where in 1955 and 1956 it flew in thousands. Apart from the hazards of the plough and the temptations of subsidies, I should expect to see it in strength again round about 1962.

Argynnis selene L. and *Pararge megera* L. were out on May 15th. With the former this was definitely a precocious part emergence which petered out after a week and was followed towards the end of May by another and larger emergence, but poorer in numbers and quality compared with 1958. *P. megera* is becoming almost a rare insect in this area, and I have so far not seen half a dozen this season. *Hamearis lucina* L., first seen on May 23rd, is another species which appears to have suffered severely from the excessively wet season of 1958; *Ochlodes venata* Br. and Grey, was on the wing on May 29th, and on June 2nd I was greatly surprised to find quite a number of *Maniola jurtina* L. males flying on the North Downs.

Lyssandra bellargus Rott., was present in very small numbers. Fortunately, the food plant for the larva is very plentiful and the species hangs on by a thread in spite of drastic overcollecting in recent years, to some extent by collectors wishing to populate their own local downs.

With all diffidence, I would suggest that the way to attempt this is to catch only a few females, not every one seen, and to obtain from them great numbers of eggs without difficulty. As soon as the resulting young larvae become big enough to be a problem, they can be released on the downs, with, speaking from experience in Northamptonshire, good prospects of establishing a colony.

C. pamphilus was going over, but I very luckily caught a female with the apical spot completely absent on the upper and undersides. It was caged with a bunch of grass and proceeded after a time to lay a few eggs, but most unfortunately it was caught in a small web made by a very small spider, and that was that. The eight eggs laid hatched in due course, and there remains a faint possibility of obtaining an F_2 brood this year or next, and learning something about the genetics of this distinctly rare aberration.

Polyommatus icarus Rott., and *Lycaena phlaeas* L. have been occasionally seen but only in very small numbers and in strictly limited areas, though the former were naturally more plentiful on the Downs.

M. jurtina has come on in great numbers, and my favourite field for *Aphantopus hyperantus* L. is swarming with them and with *O. venata*.

On June 16th I had my first view of the Surrey *Strymonidea pruni* and on the 18th I was able to watch three nice females going about their business on the Blackthorn, with occasional breaks for refreshment at the flowers of Buckthorn. It is extraordinary how popular this minute blossom seems to be, even to *A. selene* in the same little enclave.

On the 21st June I first saw a few specimens of *Thymelicus sylvestris* Poda which are never as plentiful in this neighbourhood as *O. venata*, and on the 22nd, while releasing half a dozen *Apatura iris* L. I had my first view of *Limenitis camilla* L. Generally speaking the present season has produced splendid weather but very few butterflies, and the extreme dryness since the end of April, and the subsequent hot weather have together induced early emergence and a short life.

I have seen no migrants apart from one *Vanessa atalanta* L. on May 22nd, very few *Nymphalis io* L., and less than a dozen *Aglaia urticae* L. of the new brood.

It is to be hoped that the quiet and warm weather of the past two months may have led to unrestricted egg laying on the part of the spring butterflies, and so to an enlarged population in 1960.

Some Light on the Genetics of *Pyrgus malvae* L, ab. *taras* Bergstr.

By Major A. E. COLLIER.

In May 1958 I took a very nice, but not extreme, example of *Pyrgus malvae* L. ab. *taras* Bergstr. It was a female, in fair condition, and from it I hoped to obtain information in due course concerning the genetics of this character, which occurs regularly and not very infrequently in certain localities.

Like other *malvae* in my experience it proved to be a shy layer, and when it died a week later I could only find a dozen eggs, from which in the spring of 1959 there survived only six pupae.

On May 25th three males emerged, which, much to my surprise, were all good examples of *taras* at least equal in quality to their mother. On the 25th two females and another male emerged, all similar in character to their brothers.

Each of the females was caged with two brothers, and, although no mating was observed, the better of the two females began to lay on June 2nd, and had laid twenty eggs by June 9th when death intervened. The other female failed to lay at all.

I had been obtaining eggs from another sib mating in this same period and these began to hatch on and after June 18th. To my great disappointment, however, the eggs from the *taras* female proved to be infertile and my hopes of an interesting F₂ brood were ended.

From the evidence obtained it is impossible to assess the genetic constitution of the character, but it is reasonable to assume it to be inherited, and I am inclined to the opinion that the moderately rare but not extreme examples are heterozygotes and that the rare extreme ones are homozygotes.

It will be well worth anyone's while to breed from these ab. *taras* females, and I would willingly undertake to do the job for them if so desired.

A note on *Psodos coracina* Esp. in Scotland

By Commander G. W. HARPER, R.N.(Retd.), F.R.E.S.

Lepidopterists and other summer visitors to the High Tops of the Central Highland mountain mass of Scotland can hardly fail to observe the fascinating little black mountain moth, sometimes in fantastic numbers on the rare occasional hot sunny day in the odd-numbered years, such as the present one. A note on it may therefore be of some interest.

Psodos coracina Esp. is an Arctic-Alpine species which survives the now unsuitably warm climate of the British Isles only on the relatively cold tops of the highest Scottish mountains, where it is restricted to the sheets of small stony detritus which is a frequent feature of many of the summits above 2,500 feet of the Cairngorms, Monadhliaths and Grampians. Here the males, which are much blacker than the more silvery grey females, fly actively in the sunshine, rather less so on dull days. The females seldom fly freely, and should be searched for on the actual stony detritus over which they run and flutter in an

ostrich-like way, and also shelter in it and the thin growth of the crowberry associated with it. Pairs of moths in cop. may quite often be found also resting on the ground and sparse vegetation, which consists almost entirely of crowberry, lichens, and moss. Like so many Arctic-Alpine species, these interesting little moths are very generously provided with long blackish scales covering the thorax and abdomen which gives them an attractive appearance of warmth in their cold environment; this may not be so far-fetched a theory as it may seem at first sight, for the large black surface area presented to the sky must undoubtedly absorb the maximum amount of radiant heat, energy from the sun, thus giving maximum activity to the insects even when the sun is obscured, as it is most of the time!

In an average season the moth may be found best during the last fortnight of June; this year, 1959, being an early season, it was found by Mr. P. Le Masurier fully out and numerous on 10th June, in spite of poor weather conditions. This species shares with *Amathes alpicola* Zett. a very curious distinction, namely a marked preponderance of adults emerging every two years, but alternating with each other, *P. coracina* being much more common in the odd-numbered years, while *A. alpicola* predominates in the even-numbered ones, both in the same habitat. The larvae of both species feed on the same plant, crowberry, and while, as Dr. E. B. Ford points out (Moths, 1955), there is nothing remarkable in both species requiring two years in their cold habitats to develop to maturity, it is extraordinary that they should stabilize their emergence from the pupae mainly in the same year. Dr. H. B. D. Kettlewell (Ford-Moths, 1955) has suggested an ingenious "balanced parasite" theory which may well account for this remarkable state of affairs, but the collection of evidence to prove it would be a herculean task involving the collection every year of considerable numbers of mature larvae of *both* species and determining the resulting parasites over a period of several years!

I do not think the adult *P. coracina* has ever been bred right through from ova. The mature but still feeding larva was first discovered and described by Mr. Austin Richardson (*Ent. Rec.*, 56: 114) and the species was bred as far as the last instar and described in great detail by the late Dr. Cockayne (*Ent. Rec.*, 56: 115). He has made it quite clear that in its normal habitat the larva hibernates for two winters, feeding whenever possible. I have found the pupa in early June lying on the peat under lichen among the stony detritus of its haunts, close to crowberry. The moth emerged a fortnight later.

20/vii/1959. Nedaich, Newtonmore, Inverness-shire.

Notes on some Carpet Moths in Derbyshire

By T. D. FEARNEHOUGH

The earliest of the carpet moths to appear in my district is *Colostigia multistrigaria* Haw. which normally flies in late March and early April. Near my home there is a very strong but restricted colony, and I have been able to examine some hundreds of specimens. On mild evenings, the moths are quite active and have to be netted, but on cool evenings they are sluggish and can easily be examined as they rest

on grass stems and twigs. The colony is of special interest as it produces melanic specimens to an extent of approximately 5 per cent. of the males. The females, however, are almost wholly of the pale form but show extensive variation in the wing markings. During the past season, I found the only black female I have seen, and from it a good batch of eggs was obtained. The resulting larvae were easily reared until about half grown on heath bedstraw from the site of the colony. Then came disaster, for to save myself the frequent walk to obtain fresh food plant, I changed to goose grass, which grew nearer to hand, and to which the larvae seemed to have no objection. A few days later disease appeared and a panic return to heath bedstraw was of no avail, for the entire brood perished. The non-melanic males vary in their markings very considerably, with an occasional tendency to banding, and sometimes with a yellowish ground colour.

Colostigia didymata Linn. is abundant and widespread, but the moorland colonies are of special interest in that their variation runs parallel to that of *multistrigaria*. Black specimens occur on the moors, but again, there seem to be only males, for I have not yet seen a melanic female among the large numbers examined. The moths can be walked up from the heather at any time of the day and can be found at rest on stones and walls, but they become naturally active an hour before sunset and can then be seen assembling and mating. Sometimes they fly in favoured spots in bewildering profusion. The high moorland males are of a generally darker form than those found on lower ground, but true melanic specimens are scarce and in a lower proportion than are the melanic males of *multistrigaria* in the colony described above.

Another abundant and interesting, but somewhat puzzling, carpet is *Hydriomena furcata* Thbg. This species occurs in profusion on the moors, and is so abundant on areas of heather away from bilberry, that I feel certain that heather is the main foodplant, although no doubt bilberry is eaten as well. I have on several occasions watched females depositing eggs on heather, and they are quite indifferent to the glare of my torch. The moths often crawl up from the tangle of heather stem and ground debris just before sunset and may then be found at rest in numbers, but not until the sun has set do they become really active, and reveal their abundance by taking to the wing. The moorland specimens tend to be smaller than those from other habitats, but their variation in combinations of colouring, banding and spotting is beyond description. Strangely, on the two moors where I have given the moth particular attention, melanic specimens do not seem to occur. On the fringe of one of these moors, there are groups of old willows from which I have several times collected *furcata* larvae, which, reared at home, have given mostly dark and melanic specimens, yet the wild moths collected from the heather near by are of entirely different forms and are never melanic. Can it be that the darkening of the reared specimens is due to the artificial environment? During the season of 1958, I made several visits to the locality after dark to collect specimens around the willows, but I only found moorland forms and no melanics. And what of the *furcata* that feed on bilberry, which is such an excellent substitute for willow, or should it be the other way round? In contrast, the specimens which sometimes at home fly in from the garden are invariably melanic, but equally invariably worn and damaged.

Porritt, in his Yorkshire list of 1904, writes concerning this species: "In the south West Riding there appear to be two distinct races, a small very dark, often quite black form which occurs on the moors and in the woods having an undergrowth of bilberry and ling, and the other, the ordinary larger and usually greener form which occurs in lanes and woods generally. Both forms are equally plentiful within a good radius around Huddersfield, the small darker form feeding principally, I think, on bilberry, the other feeding on willow and many other trees".

Later, however, in his Supplement, he inconsistently writes: "The south West Riding moorland forms vary infinitely, and many of them are exquisitely pretty. I know of no place where more varied and beautiful specimens can be obtained than on the Harden Moss Moors, Huddersfield, and many of the forms in that district seem not to occur elsewhere. A number of my own specimens are figured in Barrett's *Lepidoptera of the British Islands*".

South says in his *Moths*, Vol. II: "It feeds on willow, poplar, hazel, bilberry and heather", and then goes on to say that he has seen the small bilberry feeding forms on Exmoor in late June, and in the same district, the larger willow feeding form about a fortnight later.

An interesting note by Mr. W. E. Minnion on the habits of *Hydriomena furcata* Thun. appeared (*antea*, p. 87).

A very few years ago there was a large wood near my home, and within it a clearing which was carpeted with heath bedstraw. Here in June *Epirrhoe tristata* Linn. could be seen flying in scores in the sunshine and darting up in numbers at every step. Alas, this is no more, for the open-cast coal grubbers have been and have departed, leaving a desert of waterlogged grey clay. However, *tristata* still occurs on the fringe of the desecrated woodland, the form being often darker than South's illustration of a Yorkshire specimen (Vol. II, pl. 81, fig. 11). It also occurs locally in the moorland areas of north Derbyshire in July on the high ground, and it may often be seen flying swiftly in the sunshine along the verges of moorland roads. I once reared a brood from eggs, but the changing of the heath bedstraw foodplant for a brood of the small active larvae is a nerve-racking business.

It is always pleasant to find a species in one's neighbourhood for the first time, and in October 1957 I had the pleasure of finding a strong colony of *Chesias legatella* Schiff. One day when strolling about a mile from home I came on a goodly area of broom, so I returned the same day after dusk to see whether *legatella* was in fact there. It was, and in good numbers, too! The following season the moth seemed to be still more plentiful, and a nice series could be selected. I had some difficulty with the females, for whereas male specimens were readily obtainable and in immaculate condition, the females were mostly damaged and apparently had little regard for the preservation of their fringes. The reason for this, I imagine, is that the males, having done their primary duty, are content to sit placidly on their broom stalks, whilst the females crawl amongst the tangle prospecting for egg-laying sites.

Cheimatobia fagata Scharf. is a moth which is never flattered by its portraits, but it is quite a nice moth when seen by torch-light in its native haunts. The species is common in my neighbourhood, and I go to look at it every year. November 5th last year was remarkably fine and mild so, having observed the rites essential to that evening,

I walked to a large birch thicket a little more than a mile away and had the pleasure of seeing a larger show of *fagata* than I have seen before. They were dangling from the birch twigs in great profusion, and showing yellow in the light of the torch. The females cling very tightly to the twigs, and the mated males have the peculiar habit of letting go their hold on the twigs and dangling head downwards from their female partners. I often find mated pairs on dead fronds of bracken, or on grass stems or rushes, yards away from the nearest birch, and I can only suppose such females have little chance of finding a suitable place to deposit their eggs. Unlike its near relative *brumata*, this moth shows no tendency towards melanism.

Cheimatobia brumata Linn. is, of course, common almost everywhere, but I never before saw such numbers as occurred in the local woods last season. On 2nd December, I took a stroll in the woods after dark and found every tree with its quota of the moths. On a large oak trunk, seventy males were counted, and of these, ten were paired with females. If this represented, say, one-fifth of the season's emergence, and supposing each female would give an average of 200 eggs, then the tree would have a potential caterpillar population of 10,000. I have made two night searches for this species on the moors without success. I feel that bilberry should be a suitable natural foodplant, and I have in mind the possibility of a moorland form of *brumata*. Perhaps my timing was wrong and I must try again, but enthusiasm is not always keen enough to urge one to the moors on a December night. The males vary in ground colour from straw to almost black, and well banded forms are not uncommon.

There are three moorland species which I associate together (*testata*, *populata*, and *filigrammaria*) because the females are so much smaller than the males. One wonders whether the females of these species are on the way to becoming apterous, for passing their lives surrounded by such an abundance of food, there is little need for flight. The males, of course, fly around searching for partners.

Lygris testata Linn. is to be found in diverse and widespread habitats, but to me it is a moth of the moors, where it occurs in abundance. Ground colour variation is extensive, varying from ochreous to near black. Although the moths may be flushed from the heather in the daytime, they are not then easy to catch, especially if the usual stiff breeze is blowing. At sundown, they come up from the herbage and their first thought seems to be food; often specimens may be found feeding on heather bloom before it is dark enough to use a lamp. After dark, both sexes may be easily examined as they feast.

Lygris populata Linn. appears a week or two before *testata* and is usually plentiful wherever there are patches of bilberry. Variation is extensive but so far I have not met with any of the dark forms which occur in places further north. Odd specimens may be found in the daytime and sometimes disturbed from the herbage, but about an hour before sunset they often appear in numbers sitting quietly on the higher stems of heather, bilberry or grass. About sunset they become more active and pairing often occurs before it is dark, but full activity awaits darkness when the males fly freely and the females are to be found crawling about the bilberry depositing their eggs.

Oporinia filigrammaria Her-Schaff. was located a few years ago when the chance finding of a larva in the day time by Mr. L. Barringer

gave us the clue. Subsequent exploration has indicated a colony restricted to a comparatively small area of a large moor. No doubt, further search will show its presence elsewhere on the many moorland areas of north Derbyshire. Specimens have been found in the day-time in the late afternoon, earlier searching having proved fruitless. Early one afternoon last August a thorough search was made of the *filigrammaria* locality without reward and I moved on to other parts and interests. On returning about 5.0 p.m., half a dozen specimens were picked up sitting conspicuously on the heather and in one instance on the upper side of a bracken leaf. After dark they become active but are difficult to pick out amidst the hosts of commoner moths. I have not yet examined enough specimens to be able to say much about variation, but generally the males are well marked and darker than the females. I found a specimen of the latter sex almost completely white but both hind wings were severely crippled. Eggs may readily be obtained from females boxed with a sprig of heather; they are pale green and change to dusky red after a few days.

Thera obeliscata Hübn. is common in the district but I had neglected this species until last October, when I made a survey of the scattered pine plantations with a beating tray. Larvae of *obeliscata* were numerous and of two distinct sizes, some being almost full fed and others very small. The tiny ones had brownish heads and I hoped for *firmata*, but when they changed their skins they had the green heads of *obeliscata*. All fed readily indoors and showed no inclination to become dormant, but most of the large larvae proved to be infected with parasites. The small larvae were free from parasites and eventually a fine series of moths was reared. All the moths were melanic, some being almost black without markings and others having a black band on an almost black ground. It is interesting to note that many of my larvae came from a wood in which a friend found the moths commonly, at rest on tree trunks about twenty-five years ago. In contrast to my black specimens, his were all of the pale grey typical form with a darker band on the forewings.

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British Heterocera in South Africa

By J. S. TAYLOR.

In the *Record*, 63 (1951), an account was given of the British species of Sphingidae occurring in South Africa. The present notes deal with some other members of the Heterocera on the British list which have been recorded in this country, but excluding those affecting stored products such as species of *Ephestia* and the like which are of world-wide distribution. With one exception, the species dealt with below are included in Janse's Check-List (1917). It is probable that their number has been augmented since, but in the absence of published records it is difficult to obtain information.

For data as to the occurrence of many of the species in Britain, the writer has had to rely on South (1907), published long before the advent of the mercury-vapour lamp changed the status of so many

moths. Here again, therefore, these notes cannot claim to be in any degree exhaustive. For the Pyralidae, the data is more up to date, thanks to Beirne's (1952) invaluable volume.

It seems noteworthy that of the twenty-three species listed in these notes, sixteen are known to be immigrants in Britain; three are probable immigrants; one is an occasional introduction; while three only are more or less regular residents.

Information concerning the life-histories and habits of these twenty-three species in South Africa is lamentably meagre. In only eleven of them is anything known at all, while in but four of these is there data available in any detail. In the majority of cases the adults only have been obtained, presumably at light for the most part. Nothing is known of their migratory tendencies, if any, and, as Williams (1958) so aptly remarks of the migration of moths in the tropics, "our ignorance is phenomenal". This statement could be well extended to cover life-histories also.

The twenty-three species forming the subject of these notes are listed below; details in brief concerning habits being included when known.

ARCTIIDAE

- (1) *Utetheisa pulchella* L.

Crimson Speckled

NOCTUIDAE

- (2) *Euxoa segetum* Schiff.

Turnip Moth

Apparently resident in Britain (South, 1907). In South Africa the commonest and most widespread of the cutworms in the writer's experience. The larva is found in the soil, and when numerous is most destructive to seedlings of many crops including peas, crucifers, tobacco and cotton, as well as garden plants. Up to 1,654 eggs have been deposited by one female, while the average for 12 females was 785.

- (3) *Euxoa spinifera* Hbn.

According to South there is only one British record, but more may have occurred in recent years. In S. Africa the larva has been found feeding on the flowers of hollyhock, while the adult has been taken in bait-traps for fruit-fly. Pearson (1958) records it as a pest of cotton and potatoes in the Sudan. It is widely distributed in Southern Africa.

- (4) *Agrotis ypsilon* Hbn.

Dark Sword Grass

Popularly known as the Greasy or Black Cutworm, and recorded as a pest of cotton in Egypt, the Sudan and S. Africa by Pearson (*op. cit.*), who also states that in S. Africa the main infestation is on winter-irrigated crops. In Egypt this species is apparently unable to tolerate the hot summer, and migration is suspected. It is known as a migrant in India, and is widely distributed in the Union and Rhodesia.

- (5) *Cirphis unipuncta* Haw.

American Wainscot

Termed an army worm in the United States where it is a pest of cereal crops, there are apparently no records of the immature stages in S. Africa. The adult has been obtained at Stellenbosch, C.P.

(6) *Cirphis loreyi* Dup.

Cosmopolitan

The adult has been recorded in Cape Province, Natal and South West Africa.

(7) *Laphygma exigua* Hbn.

Small Mottled Willow

Generally distributed in S. Africa where the larva is known as the Lesser Army Worm, while in the United States it is termed the Beet Army Worm. The larva feeds on a great variety of crops and indigenous plants including pigweed *Amarantus paniculatus* L., hence the old name of Pigweed Caterpillar. When it occurs in large numbers it can be very destructive, but usually, as Pearson (*op. cit.*) points out, "high populations are speedily reduced by parasites and disease". The same author describes the life-history in detail. In S. Africa this species apparently breeds continuously where conditions are suitable, and there appears to be no evidence of migration, although this has been suspected to occur in the related *L. exempta* Wlk., the true Army Worm. Phase variation has been found in the larva of *L. exigua* (Faure, 1943).

(8) *Heliothis peltigera* Schiff.

Bordered Straw

Nothing seems to be known of the immature stages in S. Africa, but the larva has been recorded on cotton in the Sudan (Pearson, *op. cit.*).

(9) *Heliothis armigera* Hbn.

Scarce Bordered Straw

This widely distributed species is popularly known as the American Bollworm, although its American counterpart is now held to be a separate species, *H. zea* Boddie. In S. Africa it is a pest of major importance, the larva feeding on a wide variety of cultivated and indigenous plants. It is an important pest of cotton, maize, tobacco, tomato, peas and citrus. There are, indeed, few cultivated plants, including garden flowers, which are not subject to attack, and infestations are frequently heavy and severe. In the warmer parts of the country, this species is to be found throughout the year. The life-history is given in detail by Pearson. The adult is sometimes taken at light, and the cannibalistic tendencies of the larva are well known.

While there is no definite evidence of long migratory flights in S. Africa, it may be that such do occur. The sudden and severe infestations which are characteristic of the species lend support to this theory, but, on the other hand, they could equally well be due to previous and less numerous generations on garden plants and indigenous hosts. Migratory flights of 500 miles have been claimed for *H. zea* in the United States.

(10) *Plusia ni* Hbn.

Ni Moth.

Widely distributed in the Union.

(11) *Tathorhynchus exsiccata* Led. (*vinctalis* Wlk.).

This species, first recorded in Britain of recent years (Lees, 1951), is known from S. Africa, and the larva was found in 1942 feeding on lucerne at Graaff-Reinet, C. P., by the writer. Widely distributed in Southern Africa.

GEOMETRIDAE

(12) *Rhodometra sacraria* L.

Vestal

Distributed throughout S. Africa (Janse, 1932/5), but apparently nothing is known of the immature stages.

(13) *Semiothisa alternata* Warr.

Sharp-angled Peacock

The adult has been obtained at Durban and in Zululand (Janse, *op. cit.*), also in Mocambique.

PYRALIDAE

(14) *Crambus contaminellus* Hbn.(15) *Eromene ocella* Haw.

Stated by Beirne (1952) to be an occasional introduction in Britain. Widely distributed in Southern Africa.

(16) *Alispa angustella* Hbn.(17) *Antigastra catalaunalis* Dup.

Described by Beirne (*op. cit.*) as "a scarce non-resident vagrant" in Britain. The larva was found many years ago by the writer causing serious damage to *Sesamum* in the Eastern Transvaal. The young leaves and seedpods were attacked, the former being webbed together. The larva has also been recorded on *Antirrhinum* in the Transvaal, and on *Sesamum* in India and Burma. Widely distributed in Southern Africa.

(18) *Diasemia ramburalis* Dup.

Widely distributed in Southern Africa.

(19) *Nomophila noctuella* Schiff.

Rush Veneer

There appear to be no definite records apart from the adult which is widely distributed in South Africa, but it has been reported as "lucerne moth" and as injuring wheat. Beirne (*op. cit.*) mentions clover and grasses as host-plants, and it is therefore quite likely that the larva has occurred on both wheat and lucerne in this country.

(20) *Pyrausta martialis* Guen. (*ferrugalis* Hbn.).

Rusty Dot

Until comparatively recently the adult only was known from S. Africa. In 1947, the writer recorded the larva near Grahamstown, C.P., feeding on *Lepidium capense* Thunb., an indigenous crucifer, and in 1958 on lettuce at Port Elizabeth where it appears to be of common occurrence.

PTEROPHORIDAE

(21) *Stenoptilia zophodactyla* Dup.

Widely distributed in Southern Africa, and apparently resident in Britain.

Aegeridae

(22) *Synanthedon tipuliforme* Clerck.

Currant Clearwing

The only species listed here not recorded by Janse (1917).

The larva was discovered at George, C.P., in September 1936 infesting currant stalks, apparently an accidental and recent introduction.

All the infested stalks were destroyed, and this remains the only record for S. Africa, nothing having been heard or seen of the species since.

TINEIDAE

(23) *Plutella maculipennis* Curt.

Diamond-back Moth

Well known in S. Africa as the Small Cabbage Moth where, as elsewhere, it is a pest of cabbage. Nothing seems to have been recorded as to the migratory habits which it exhibits to a marked degree in Britain and Europe, and which are suspected in the United States.

ACKNOWLEDGMENTS

The writer is indebted to Dr. H. K. Munro, Division of Entomology, Pretoria, for several of the records embodied in these notes; also to Dr. L. Vari, Transvaal Museum, for data on distribution.

REFERENCES.

- Beirne, B. P. 1952. *British Pyralid and Plume Moths*.
 Faure, J. C. 1943. Phases of the Lesser Army Worm (*Laphygma exigua* Hbn.). *Farming in South Africa*, **18**: 69-78.
 Janse, A. J. T. 1917. *Check-List of the South African Lepidoptera Heterocera*.
 ———. 1932-5. *The Moths of South Africa*, 1 and 2.
 Lees, F. H. 1951. *Tathorhyncus exstecata* Lederer in South Devon. *Ent. Rec. and Jl. Var.*, **64**: 131-132.
 Pearson, E. O. 1958. *The Insect Pests of Cotton in Tropical Africa*.
 South, R. 1907. *The Moths of the British Isles*.
 Williams, C. B. 1958. *Insect Migration*.

Box 7011, Port Elizabeth. 14.vii.59.

Temperature Varieties of *Aglaia urticae* L. *Nymphalis polychloros* L. and *Nymphalis io*. L.

By Major-General C. G. LIPSCOMB, D.S.O.

In common with many other entomologists I have in the past bred several thousands of *Aglaia urticae* L. from wild larvae, without obtaining any notable results. In fact, apart from a few interesting colour forms and a solitary f. *selysi* Donckier de Donceel, the remainder have been to all intents and purposes normal specimens. Such a result is enough to dampen the ardour of the keenest entomologist and accordingly last year I decided to investigate the effects of low temperature on the pupae and resultant butterflies. The nettle beds which flourish on the banks of the Rhine near Cologne provided an endless source of larvae and my domestic refrigerator the means of conducting the experiments.

I started in a modest way with 10 pupae placed in a flat cigarette tin on the top of the ice cube tray in a constant temperature of 29° F. Here they were left for two days before being removed to continue their development under normal conditions. The pupae were frozen within 24 hours of pupating and the butterflies emerged about a fortnight after they had been removed from the refrigerator. This first experiment produced one f. *selysi*, all the rest being normal. Thereafter a series of batches of pupae, in each case from a common brood, were "put in the cooler" with the results shown in the accompanying table:—

Brood No.	No. of pupae.	Stage frozen in days after pupation.	Length of time frozen in days.	Temp. details.	f. <i>selysi</i> .	f. <i>lucia</i> including those with black hindwings.	f. <i>ichneusoides</i> .	f. <i>nigrita</i> .	Remarks.
1	10	1st	2	29° F.	1	—	—	—	Early September emergence.
2	30	1st	4	29° F.	4	—	1	1	Early September emergence.
3	190	1st	4	12 hrs. @ 16° F. then 3½ days @ 29° F.	13	5	—	2*	*Both cripples. One specimen referable to f. <i>gruetii</i> Corcelle emerged from this brood. Its hindwings are black brown and the forewings are heavily suffused with only the base of the wings and another very small patch below the discoidal showing traces of red ground colour. Late September emergence.
4	98	2nd-7th	4	29° F.	—	—	—	—	Emerged end September. 30% mortality—no sign of variation.
5	87	1st	4	29° F.	—	—	—	—	Emerged late October. Two specimens with enlarged blue lunules on all wings, all the rest normal.
6	64	1st	3	24 hrs. @ 10° F. 2 days @ 29° F.	—	—	—	—	All normal. Emerged early November.

An examination of this table brings to light the following interesting facts:—

- (a) The great powers of survival of this butterfly early in the pupal state in really low temperatures. Those from brood 6 survived a 24 hour period in a temperature the equivalent of 22° of frost.
- (b) The depth of freezing seems to have no direct relationship to the production or type of variety.
- (c) If the pupa is frozen after the first 24 hours of its existence it is unlikely to produce a variety and it would seem to be much less able to survive the cold. The future colour structure of the butterfly must therefore be laid down immediately after the change to the pupal state has taken place.
- (d) All the types of variety produced by this artificial method, including extreme f. *gruetii*, have occurred in the wild state, and indeed, with the exception of f. *gruetii*, I possess examples of all shades of the various forms caught by myself. This would indicate that abnormal environmental factors and hereditary ones can produce forms which externally at any rate are identical.
- (e) It would seem that pupae from the late autumn broods, i.e. 5 and 6 in the table, do not produce butterflies that vary however much they are subject to below freezing temperatures. If these two broods had been left to develop out of doors they would almost certainly have perished either in the larval or pupal state. On the other hand if they should have succeeded in producing butterflies they must all quickly have gone into hibernation. This leads me to wonder whether, at any rate in the case of this butterfly, there is not some connection between non-hibernating specimens and those with the ability to vary.

Further weight is added to this possibility by the fact that, in my own experience, major varieties usually occur in the wild state in the summer broods.

For the sake of clarity and to avoid confusion I have used those names for the various forms of variety as are proposed by Lempke in his article on "Some Forms of *A. urticae*" that appeared in the December, 1956, number of the *Record*.

Profiting from my last year's experiences, I decided this summer to carry them a stage further and see what the results would be with *Nymphalis polychloros* L. and *Nymphalis io* L.

N. polychloros is as uncommon in Germany as it is at home, so I was lucky to find a brood of larvae in May when they were nearly full fed. They were feeding on an elm tree in a public park on the outskirts of Cologne, so their collection presented certain problems not least the avoidance of awkward questions from the ever inquisitive police! However, all went well and I was ultimately left with 102 pupae which, within 24 hours of pupating, were placed in the refrigerator for 3 days at a constant temperature of 29° F.

As a result of this treatment 20 died and another 10 ultimately failed to emerge although fully forward in their pupa cases. Of those that hatched the great majority were normal but several showed variation in the depth or lack of dark coloration in the outer borders of the wings, a darkening of the gap between the second and third spots on the front edge of the fore wings and the absence or reduction of the

two discoidal spots. These results were rather disappointing as I believe it should be possible to produce f. *testudo* South from temperature experiments.

Also in May I found a large brood of 350 or so *N. io*. The larvae were still in their first skin when collected, but even so quite half of them proved to be stung and so failed to develop. The healthy ones fed up rapidly and were placed in batches in the refrigerator as they pupated. They also were kept at 29° F. for 3 days. Mortality was very high and eventually only 40 butterflies emerged of which 3 only were normal, 29 were f. *belisaria* South, some very extreme, and 8 were f. *semiocellata* Frohawk. After my experiences with *Polychloros* I found this a surprising result.

I hope those butterflies I liberated may at least give a thrill to some earnest German entomologist. Perhaps I may even yet see such an enthusiast throw caution to the winds and chase one across the public park where I ran the gauntlet of the police!

I am fully aware that nothing in this article can be called original research, as all this was done in the early days of this century by Merrifield. Unfortunately, I have no reference books with me to which I can refer and compare my results and deductions with his and the reader, if he is sufficiently interested, will have to do this for himself.

What I do know is that it has relieved the monotony of overseas service as well as being for me a most interesting experiment and one which has provided my family with a lot of excitement as to "what is going to come out next"!

Cologne. 8th July 1959.

We have heard with regret of the death on March 5th, 1959, of Clorinda Querci, so well known to past generations of lepidopterists. An account of her life appeared in this magazine recently (*Ent. Rec.*, 69: 39-44, 68-73), and we print below a short obituary note contributed by her husband. We offer our sincere sympathy to Signor Querci and to his family in their sad loss.—ED.

Obituary

CLORINDA QUERCI

Clorinda Di Nino was born at Farindola, a village of the Abruzzi, on March 16th, 1874, the daughter of a wealthy farmer, but unfortunately, both her father and mother died when she was but two years old. Her relations took all that her father had left for her and gave her little consideration. At the age of seven she was sent out on to the mountain to collect firewood, and there the little girl was first attracted by the butterflies on the wing; she caught them with a cloth, but on her return she was beaten for having lost time. Her aunt, however, could not deter her, and the child continued to catch butterflies.

At the age of ten, she ran away to the nearby town of Penne, where, miserable and starving, a good Roman woman saw her and asked what she was doing. To this enquiry Clorinda replied: "I wish to go to Rome to become a rich woman and buy a house with a garden better than that which my relations have taken from me."

That woman adopted the orphan girl, and taught her a great deal: Clorinda made dresses and hats. My mother was one of her customers, and together with my father gave her a good education. I was at that time a poor government official, and was very much in awe of this beautiful and energetic girl. Once I met her in the fields of Monte Sacro, near Rome, where she showed me how to catch butterflies, but until then I had scarcely exchanged a word with her.

One winter's day I was struck by a snowball from her balcony, and in the afternoon I asked her whether it had amused her. She replied smiling: "Very much"! and I then said: "Signorina, take care what you are doing: this is not play. From the way you are dressed, I infer that you are an ambitious woman, but I am a poor man; what can we do together?"

"Look at me carefully," she replied, "the stuff of my dress is very cheap, my hat has been made up from two old ones that your mother gave me though they look well as I have made them up. I am able to work, and I do not wear ornaments and I do not care for jewels. Together we shall become wealthy and esteemed people.

"What you say is very nice," I replied, "but I am not old enough to marry without permission from my parents". (You will remember we were living in the nineteenth century). Clorinda smiled and said: "Yesterday your father, who loves me, gave me two Latin quotations: *Audax fortuna juvat*, and *Alea jacta est*, and explained their meaning. I have done as Julius Caesar did; now I must run to tell your parents what has happened. They are waiting for me."

We had not spoken of love; we had made a bargain and shaken hands on it as do farmers in the market, but a great love flourished at once and continued for sixty-four years without a cloud.

For some years we lived in poverty, but we collected all the time. One day while cycling in a valley of the Apennines, we stopped in a small patch of shade, and Clorinda saw a nice *Zygaena*, quite different from others we had seen, at rest on a bramble. We took several of them, and they varied to an astonishing degree. We sent a series to Mr. Charles Oberthur of Rennees, who paid well for them and made up a plate of his great work to illustrate the most extreme specimens of that race. He also invited us to attend the exhibition of Lepidoptera at Geneva.

My wife and I went to that city, taking with us a box of our precious *Zygaena*, but in the presence of the most beautiful and rare specimens of the world, no one thought to look at our box. Entomologists from several countries had come to Geneva, and we attended a field meeting with them. Clorinda was lucky and took a butterfly variety which the others had not noticed, and she noticed Prof. J. Reverdin, who was near to her, glance at it enviously. She offered him the specimen as a gift, and he took it, at the same time inviting us to a dinner he was giving to some of the "big men" of lepidopterology. I was at the lower end of the table, but my wife had the place of honour between Prof. Reverdin and his son, who spoke Italian perfectly.

All the men were interested in her alertness and asked her to speak of her catches, and she said: "I will first tell you how I captured my husband", and told of our first meeting in a street in Rome. The men gathered round in a circle, and she turned the conversation to the

subject of the *Zygnaena* she had taken in the Apennine valley. She was asked to show the specimens and many were purchased at good prices. This was really the beginning of our becoming known to lepidopterists.

For many years, fortune was with us, and when in 1937 we returned to Italy after collecting in many countries of Europe, America and Africa, we had amassed a reasonable amount of money, which on Clorinda's advice, I changed into gold coins. In 1938 our daughter, with her husband, Prof. Enzo Romei, went to collect in Somaliland, and her knowledge of English enabled her to assist the British forces in the matter of the supply of food to the forces and to the natives. After the war, this secured for her a post with UNRRA, where she was asked by an American soldier where he could buy some gold. She at once thought of my gold coins and sold them at a very good price. When at Formia, she bought a building which had been damaged by bombs and her husband saw to reconditioning it for us, so that at last Clorinda had the beautiful villa of which she had dreamed when she was a poor and hungry child in the streets of Penne. She was happy there and went daily to the slopes of the Aurunci mountains, taking a large number of insects, for although she was almost eighty, she was active as a gazelle.

One sad day, she was crushed against a wall by a restive horse which had mounted the pavement, and she became unconscious. The energetic woman who for seventy-three years had collected in many parts of the world (a record which perhaps no man has surpassed) never recovered, and she became helpless as a baby. Two devoted nurses have since helped me to care for her; she recognized only me, and was happy when I was with her.

On March 5th, 1959, she called insistently for me by my nickname. I went to her bedside and she whispered a few incomprehensible syllables and seemed distressed that I could not understand her; she then slowly moved her right hand across her chest as like a crawling ant. I asked if she wanted me to continue my study of the ants and she nodded and smiled. This was not a smile of pain; it was the smile I had known throughout my life, and I was glad to note that she was not suffering.

I telephoned Rome, and our daughter Erilda and grand-daughter Lycaena quickly arrived with their husbands. By sunset the heart of my beloved Clorinda had ceased to beat. She died like a wealthy and esteemed woman, just as she had told me the first time we had spoken together in a street in Rome. On her bed, filled with flowers, she seemed to me as beautiful as she had appeared sixty-eight years ago on the Sacred Mount of Rome.

Orazio Querci, Vendicio, Formia (Latina). August 10th, 1959.

Beetles, etc., swarming on a Sea Wall

By A. A. ALLEN, B.Sc., A.R.C.S.

The phenomenon described below took place at Seasalter, near Whitstable, north-east Kent, on the 28th August 1958. The middle of the day was marked by heavy storms, after which a period of calm ensued in the early mid-afternoon—the sun acting on the moisture-laden atmosphere to produce conditions, for an hour or so, peculiarly

favourable to insect activity. In the writer's experience such occasions are most infrequent, falling on an average scarcely oftener than once or twice a year; and their duration may be so short (sometimes a bare half-hour, terminated perhaps by a freshening breeze, and in any event by the steady reduction of humidity) that the entomologist is fortunate if he is able to take advantage of them. At these times one is embarrassed, not by the scarcity of the quarry—so often the collector's loudest lament—but by precisely the reverse; and never is the limitation of possessing but one pair of hands (to say nothing of the inability to be in more than one place at a time) more acutely felt! On this occasion I was lucky in having the company of my friend Mr. J. M. Chalmers-Hunt, without whose active and keen co-operation several interesting species would, I am sure, have remained unnoticed.

The sea wall in question, a flat-topped concrete structure 4-5 feet high stretching for a mile or two between the resort itself and the salt-marshes (for which we happened to be bound), formed a most suitable landing-, resting-, and taking-off-place for the myriads of insects with which the air was for a time filled; and thus also a highly convenient base from which to collect them—or rather, select from among them, for mass-collection would have been manifestly impossible, unprepared as we were for anything of the sort.

We arrived on the scene shortly before the 'swarm' appeared to reach its climax, which was maintained for perhaps rather under an hour; and as we worked slowly along the wall for most of its length, with the springing-up of a light wind the numbers gradually declined. The insects were clearly coming from the landward side, not from across the sea.

Coleoptera—mostly small species—made up the bulk of the 'swarm', but a multitude of small Hymenoptera and Diptera accompanied them as always on such occasions. Doubtless some other orders were represented, though there were strangely few Hemiptera-Heteroptera; of these I saw only two specimens, a *Heterogaster urticae* F. (Lygaeidae) and an *Anthocoris nemorum* L.—a ubiquitous species. The flat top of the wall was preferred but the vertical sides too were fairly well patronized, especially that facing the sea—three species at least (*Helophorus rufipes*, *Achenium depressum*, and *Phytonomus austriacus*), showing a decided preference for the latter. Indeed the *P. austriacus*, a rather large and heavily-built weevil (the *Hypera punctata* of older works) which probably flies little, may well have mostly climbed up to bask on the wall from the short herbage at the base.

In proportion to the vast number of specimens present, and considering the favourable situation, the genera and species noted are really very few. Only two or three have any pretensions to rarity: a tiny rove-beetle, *Atheta glabricula* (or *glabriculoides*?—see footnote), *Helophorus porculus* (very uncommon in the South, according to my experience), and *Aphodius nitidulus* (infrequent and mainly coastal). But provided its great incompleteness is borne in mind, a list may be worthwhile if only to give some idea of the general composition of the coleopterous component of the 'swarm' and the principal types represented. It will be seen to comprise remarkably few truly coastal or even estuarine forms, and not one can be called strictly maritime; the great majority are such as might be expected on open ground almost

anywhere—in this case no doubt the rough pasture-land behind the wall. However, *Bembidion normannum* and *Quedius pallipes* are purely salt-marsh species, while several others naturally are species commoner near the coast than inland. The Staphylinidae easily outnumber any other family and of them the best-represented genus was *Quedius* with 8 species recorded; the huge genus *Atheta* was fairly numerous in individuals but apparently poor in species—though many must have been overlooked.

In the list which follows, approximate incidence is shown thus: I = a single specimen only found or noticed; r = rare; c = common; the absence of an indication denotes an indefinite frequency somewhere between 'rare' and 'common'. It would be useless to attempt greater exactitude.

<i>Notiophilus biguttatus</i> F., r.	<i>Tachyporus hypnorum</i> F., c.
<i>Bembidion</i> spp., including	<i>T. chrysomelinus</i> L., r. (!)
<i>B. normannum</i> Dej.	<i>Cypha longicornis</i> Payk.
<i>B. lampros</i> Hbst., c.	<i>Oligota pusillima</i> Grav.
<i>B. guttula</i> F., c.	<i>Autalia rivularis</i> Grav., r.
<i>Trechus 4-striatus</i> Schrk., c.	<i>Amischa analis</i> Grav. (the most
<i>Bradycellus verbasci</i> Duft.	abundant beetle on the wall)
<i>Amara aenea</i> Deg., r.	<i>Atheta</i> spp., including
<i>A. familiaris</i> Duft.	<i>A. triangulum</i> Kr., r.
<i>Metabletus</i> sp. (not taken), I	<i>A. atramentaria</i> Gyll.
<i>Helophorus rufipes</i> Bosc.	<i>A. nigra</i> Kr., c.
<i>H. porculus</i> Bedel, I	<i>A. longicornis</i> Grav.
<i>Cercyon</i> spp., including	<i>A. fungi</i> Grav., c.
<i>C. lugubris</i> Ol., I	<i>A. atricolor</i> Sharp, I
<i>C. melanocephalus</i> L., I	* <i>A. glabriculoides</i> Strand ?, I
<i>Megasternum obscurum</i> Marsh., c.	<i>Tinotus morion</i> Grav.
<i>Sphaeridium scarabaeoides</i> L., r.	<i>Oxyptoda perplexa</i> Muls. & Rey
<i>Acrotrichis ?sericans</i> Heer	<i>Aleochara intricata</i> Mann., I
(not taken), I	<i>A. bipustulata</i> L.
<i>Oxytelus rugosus</i> F.	<i>Necrobia rufipes</i> Deg., I
<i>O. inustus</i> Grav., r.	<i>Atomaria atricapilla</i> Steph., c.
<i>O. sculpturatus</i> Grav.	<i>Ephistemus globulus</i> Payk.
<i>O. tetracaratus</i> Block, c.	<i>Phalacrus fimetarius</i> F., r.
<i>Platystethus nitens</i> Sahlb., I	<i>Olibrus corticalis</i> Panz., I
<i>Stenus clavicornis</i> Scop., I	<i>Stilbus oblongus</i> Er., r.
<i>Astenus immaculatus</i> Steph., I	<i>Lathridius lardarius</i> Deg., I
<i>Rugilus orbiculatus</i> Payk., r.	<i>L. bifasciatus</i> Reit.
<i>Sunius propinquus</i> Bris., r.	<i>Enicmus transversus</i> Ol., r.
<i>Achenium depressum</i> Grav.	<i>E. histrio</i> Joy & Tom., r.
<i>Xantholinus fracticornis</i> Müll., c.	<i>Typhaea stercorea</i> L., I
<i>X. glabratus</i> Grav.	<i>Subcoccinella 24-punctata</i> L., r.
<i>Gyrohypnus laeviusculus</i> Steph., r.	<i>Rhizobius litura</i> F.

*Among our known species, this specimen comes nearest to *glabricula* Thoms. (= *uliputana* Bris.), to which perhaps it ought to be referred; but the description of *glabriculoides* Strand (1958, *Norsk ent. Tidsskr.*, 10 (4-5): 187) suggests that it may really belong to that species, in which case it is an addition to the British list. The question is under review.

- Philonthus* spp., including
P. intermedius Boisd. & Lac., I
P. fuscipennis Mann.
P. cruentatus Gmel., I
P. varians Payk.
Gabrius pennatus Sharp
Ocypus ater Grav., I
Creophilus maxillosus L., I
(flying out over the beach)
Heterothops sp. (not taken), r.
Quedius tristis Grav., r.
Q. assimilis Nordm., I (seized and
ate a small *Atheta*)
Q. pallipes Luc.
(typical form twice as common
as that with black elytra)
Q. oblitteratus Er., r.
Q. rufipes Grav.
Q. semiaeneus Steph., r.
Q. schatzmayri Grid., c.
Q. boops Grav., I (♀)
Mycetoporus splendidus Grav., I
Conosomus lividus Er., I
- Adalia 10-punctata* L., c.
A. bipunctata L., c. (but less so)
Coccinella 7-punctata L., r.
C. 11-punctata L.
Propylea 14-punctata L., r.
Anthicus floralis L.
Aphodius fimetarius L., I
A. nitidulus F., I
Lema melanopa L.
Cryptocephalus fulvus Goeze, I
Phyllotreta spp., including
P. vittula Redt., r.
Chaetocnema hortensis Geof.
Apion spp. (yellow-legged group)
Sitona lineatus L., r.
S. lepidus Gyll., c.
S. hispidulus F.
Phytonomus posticus Gyll.
P. austriacus Schrk.
Ceuthorhynchus rugulosus Hbst.
C. pleurostigma Marsh., I
C. quadridens Panz., r.
Ceuthorhynchidius troglodytes F.

Notes and Observations

EARLY DATE FOR CRAMBUS PERLELLUS SCOP.—I took a single fresh example of this widespread and common species at Braich-y-ddinas, west of Beddgelert, Caern., on 24th May 1959. The early date seems noteworthy.—J. M. CHALMERS HUNT, 70 Chestnut Ave., West Wickham, Kent.

OPERABIA CHRISTYI PROUT IN A SURREY WOOD.—In a mixed deciduous wood near Selsdon, *O. christyi* Prout may be found plentifully after dark at rest on twigs and at light. It is decidedly local here, being restricted to only a portion of the wood. *O. dilutata* Schiff. is also present, as might be expected, but is not nearly so plentiful, and moreover appears to be absent from that part of the wood occupied by *christyi*.

There is some variation with *christyi* at this locality. Of about 150 specimens examined in 1953-56, the majority approximate to the nymotypical form; a smaller percentage (not exceeding 15%) are melanic, and I have several that appear to be *intermedia* Heyd.

On 20th October 1956 I witnessed *christyi* depositing on a hazel stump. The stump was about one inch in diameter, and the ova were laid on the bark two to three inches below where it had been cut off.—J. M. CHALMERS-HUNT, 70 Chestnut Ave., West Wickham, Kent.

CORIZUS HYOCYAMI L. (HEMIPTERA-HETEROPTERA: COREIDAE) IN CAERNARVONSHIRE.—I noted four examples of this fine and very local black and scarlet bug on the sandhills between Llanbedrog and Aber-

soch, 23rd May 1959. They were scuttling about amongst the short grass in the afternoon sun. I am obliged to Mr. A. A. Allen for the determination.—J. M. CHALMERS-HUNT, 70 Chestnut Ave., West Wickham, Kent.

EUSTROTIA UNCULA CL. AND PERONEA COMARIANA ZELL. IN CAERNARVONSHIRE.—According to Gordon Smith (*Butterflies and Moths of Cheshire, Anglesea, Caern., Denbigh, Flint, and Merioneth*) *Eustrotia uncula* Cl. is a very rare species in that area. It may therefore be of interest to record that I took four specimens, two of which were worn, during the late afternoon of 29th May 1959. They were disturbed from a boggy heath near Dolbenmaen.

At the same time, larvae of *Peronea comariana* Zell. were extremely common at this locality in spun leaves of *Comarum palustris*. From these, a very variable series (of about 16 specimens) was bred, including several of a unicolorous dark brownish-grey form. All these North Wales examples are considerably smaller than those of a series (about 20 specimens) which I bred from Dungeness, Kent, in September 1958. It may be mentioned that the unicolorous dark form was not present among the Dungeness series.—J. M. CHALMERS-HUNT, 70 Chestnut Ave., West Wickham, Kent. 24.vi.1959.

MESOTYPE VIRGATA HUFN.—Yesterday morning, 1st June, I found in the m.v. trap among the 147 specimens of 42 species one of *Mesotype virgata* Hufn. I know it occurs at Royston and Newmarket and Mr. Noble took some on the Breck on 22nd May this year. The insect is double brooded. There are plenty of outcrops of chalk between Royston and Bishop's Stortford, but I did not expect to find the insect so close at hand and it is new for this district.—CLIFFORD CRAUFURD, Denny, Galloway Road, Bishop's Stortford. 2.vi.1959.

LIMACODES TESTUDO SCHIFF. IN SURREY.—On 18th July I took a specimen of the festoon moth, *Limacodes testudo* Schiff., on Puttenham common. South mentions nine counties for this species but omits Surrey, and I am interested to know whether this is a Surrey insect, this being the first time I have met with it in the county.—E. E. JOHNSON, Highfield House, Portsmouth Road, Guildford, Surrey.

STRYMONIDIA W-ALBUM KNOCH IN YORKSHIRE.—In his interesting article on south Yorkshire butterflies (*antea*, p. 9) Mr. J. Hardcastle-Seago refers to the absence of recent records for *w-album* in the area "B" of his illustration. I am happy to be able to put this species on the map again by reporting the capture of a female specimen at Anston, south Yorkshire, on 11th July 1959.—T. D. FEARNEHOUGH, 13 Salisbury Road, Dronfield.

MACROGLOSSUM STELLATARUM L. IN SOUTH SHROPSHIRE.—A hummingbird hawkmoth was hovering by a rose on a wall outside this house this morning. The house is 600 feet above sea level and there are hills which rise to about 1,300 feet on either side. What travellers these moths must be!—AUDREY COOKE, Hardwick Hall, Shropshire. 26.vii.1959.

MELANISM IN GRASSHOPPERS.—On receiving my latest copy of the *Record*, I was interested to see that Mr. D. G. Sevastopulo (1959, *Ent. Rec.*, **71**: 161) had already written concerning the query regarding "industrial melanism" in grasshoppers raised by Mr. J. F. Burton (1959, *Ent. Rec.*, **71**: 77). I readily concur with Mr. Sevastopulo and it only leaves me to document his note with a few published references to the development of black pigment in grasshoppers exposed to a dark (burnt) environment: viz., Poulton, E. B., 1926, *Trans. int. ent. Kongr. Zurich*, 1925, **2**: 433-451, pl. 11; Burr, M., 1928 and 1929, *Ent. Rec.*, **40**: 124-129 and **41**: 118-122; Burt, E. D., 1951, *Proc. R. ent. Soc. Lond. (A)*, **26**: 45-48, pl. 1.—D. K. McE. KEVAN, Dept. of Entomology, McGill University, Macdonald College, Que., Canada. 6.vii.1959.

THE OCCURRENCE OF PAMMENE AURANTIANA STAUD. (LEP. TORTRICIDAE) IN NUMBERS IN SURREY.—At about 3 p.m. on 26th July 1959, near Box Hill, while with Mr. S. Wakely and Dr. Macnicol, I netted an orange-brown moth that was flying rapidly about holly. I took it more out of curiosity than for any other reason, since there were several others, obviously of the same species, flying with it. On submitting the specimen to Mr. Wakely, it was immediately recognized as *aurantiana*, and consequent on this discovery it was not very long before each of us had taken a number of them. Two were observed at rest on leaves (of holly and *Olema vitalba*) and several others were taken by disturbing them from bushes.

The day was warm and cloudy with a light westerly wind, and we left soon after 4 p.m. when it began to rain fairly heavily.

Altogether it is estimated that nearly thirty specimens were seen, but owing to their rapid flight—probably induced by the close atmosphere—many were missed. There were others, too, which were probably *aurantiana*, flying high up out of reach of our nets.

The moth is extremely local, and confined here to a small portion of the copse which has a considerable variety of tree and shrub vegetation where the insect flies, consisting of Norwegian maple, holly, sycamore, common maple, walnut, bramble, rose, Spanish chestnut, elm, sloe, birch and horse chestnut. The Norwegian maple consists of a single well-grown tree, and for a number of reasons we suspect that this—possibly its seeds—may constitute the food of *aurantiana*, at least in this particular locality.—J. M. CHALMERS-HUNT, 70 Chestnut Avenue, West Wickham, Kent. 8.viii.1959.

PARARGE AEGERIA L. IN EAST HERTS.—Mr. Allan tells me that he saw *P. aegeria* on a bed of dahlias at his house in Bishop's Stortford on 7th and 8th August 1959. This species has only once been recorded for north-east Herts by me. One was taken in Bishop's Stortford in 1945. There appear to be no records for north-east Herts in the Transactions of the Hertfordshire Natural History Society.—CLIFFORD CRAWFORD, "Denny", Galloway Road, Bishop's Stortford. 13.viii.1959.

FOODPLANTS OF TRICHIURA CRATAEGI L.—Let me first get references to previous notes on this subject out of the way: *Ent. Rec.*, **11**: 165,

191 and 71: 137, 161. Horne found the larvae to be "essentially heather feeders" in Aberdeenshire. It is curious that in Inverness-shire they have different habits, agreeing rather with Mr. Allan's record from Wales. I was at Aviemore early in June this year and found a few larvae half way up the "Burma Road", all on birch. I was keeping an eye on the heather for *callunae*, and saw no *crataegi* on it. Later in the week I beat a few more from scrubby birch around a fair-sized patch of heather at the north end of the wood beyond the golf course, and then Mr. Geoffrey Cole found a place rather higher up the hill where larvae were so plentiful that we put aside our beating trays and selected those we wanted from the upper twigs. I think we could have taken a hundred each that afternoon. We were a little worried by South's remark that a larva so taken is sure to be stung, so I delayed this note until emergence started. No parasites have appeared, and moths have been coming out steadily since the beginning of August. In colour the males are darkish grey with a much darker band, a little white at its edges. In the females the band is the same colour as the rest of the wings and there is no trace of white.—J. O. T. HOWARD, Dorking, Surrey. 14.viii.1959.

A RELEASE OF *N. ANTIOPA* L. IN KENT.—I should like to put on record that at about mid-day on 24th July 1959 I released 286 Camberwell beauty butterflies in the private grounds of Sir Oliver Hart Dyke's estate at Lullingstone, Kent. Each butterfly was marked with a water-proof green dye on the tips of its forewings before release. My object in making this release, the largest ever attempted in Great Britain I understand, is a furtherance of my policy to try to establish, during my lifetime, this lovely butterfly as a resident species in Great Britain. The situation I chose this time seems to me eminently suitable as the lake at Lullingstone is surrounded by a mass of willow and sallow bushes affording ample food for any resulting broods of caterpillars. The history of these butterflies is that they were imported in the chrysalis stage from northern Italy and released within a few days of emerging on my butterfly farm.—L. HUGH NEWMAN, F.R.E.S., "Betsoms", Westerham, Kent.

THE ANNUAL EXHIBITION OF THE AMATEUR ENTOMOLOGISTS' SOCIETY will be held on Saturday, 3rd October 1959, at Buckingham gate Central Schools, Wilfred Street, London, S.W.1 (near Victoria Station), from 2 p.m. to 5.30 p.m. All interested in entomology will be welcome.

Current Literature

HANDBOOKS FOR THE IDENTIFICATION OF BRITISH INSECTS: Vol. VIII, Pt. 2 (a) Hymenoptera: Chalcidoidea (part) by Ch. Ferriere and G. J. Kerrich. (Roy. ent. Soc., London, 1958.) 40 pp., 8/6.

This timely publication heralds a great resurgence of interest in the Chalcidoidea not only in Britain but also in continental Europe. The authors point out in their introduction that the study of this group was pioneered by British entomologists of the previous century but until recently was in a state of neglect for almost a hundred years.

A brief introduction is given to the biology and general economic value of the group and this is followed by, what is rightly termed, a practical key to the families. Keys to the British genera and species of the families Cleonomyidae, Perilampidae, Euchartidae and Chalcidae follow, leaving some eight more families to be discussed in a succeeding part.

Throughout, the textual matter and the keys are admirably written and clearly expressed. Appropriate biological and distributional information adds considerably to the interest of this handbook and the general clarity of the keys, supplemented by the very clear line drawings will undoubtedly stimulate further study in Britain. Five beautifully drawn illustrations of whole insects by Mr. Arthur Smith are given at the end of the handbook.—C. A. C. 30/VIII/59.

HANDBOOKS FOR THE IDENTIFICATION OF BRITISH INSECTS: Vol. VI, Pt. 2 (C), pp. 139-255. Hymenoptera: Symphyta by R. B. Benson. (Roy. ent. Soc., London, 1958.) 20/-.

This is the third and concluding part of the author's monumental work on British Sawflies in this series. Keys are given to the 16 genera and 180 species of Nematini so far recognised for Britain. This is one of the more difficult sawfly groups owing to the superficial similarity of many of the species and their variability in the more easily perceived characters such as wing venation and colour pattern in some cases. Reliable characters have to be found as a consequence in small differences in structure proportions, the shape of the ovipositor and of the male genitalia. The reader is guided through these difficulties with the help of clear and excellent line drawings with the further assistance of supporting biological information where appropriate. The emphasis on biological and distributional facts not only aids in the successful use of the keys but also encourages interest in what has been in recent years a very under collected group apart from the activities of the author himself and a very small handful of enthusiasts.

An enormous amount of revisional work by the author has made this handbook possible and as might be expected there are a considerable number of synonymies and new names as well as the use of entirely new characters in the keys in most instances. The revival of interest in this group that has been inspired by the author is already evidenced by the large amount of new information brought forward in the 6 supplementary pages to parts a and b at the end of this handbook. Finally it is to be sincerely hoped that the original idea of completing the series with a handbook on larvae and their food plants will yet be carried out since information on these is not available to the British worker in convenient form and such would undoubtedly stimulate further interest in the group.—C. A. C. 30/VIII/59.



Twice best

A flash of gold in green-grey water, jumping silver in the meshes of the wide-mouthed net. Fish are important in the rural economy of Thailand. So, too, are vegetables. Unfortunately, what protects the one can be harmful to the other.

The main vegetable-growing area of Thailand lies in the delta around Bangkok where vegetables sufficient for millions of people are grown over a period of nine months each year. Many pests—particularly the destructive cabbage semi-looper caterpillars and spider mites—attack these growing crops right up to the day of harvest.

To meet the farmers' need for an insecticide which could be safely used up to the day of harvest, Shell's new insecticide Phosdrin was tried—with immediate success. With cabbage loopers, Phosdrin, at a few ounces per acre, achieved a complete kill within only thirty minutes and completely eliminated mites on cucumbers. A lower dosage gave control of cut-worms and thrips on onions, and in all cases the crops remained 'clean' for several days after spraying. Equally important, this

insecticide showed no harmful effect on the fish which team in the klongs and irrigation ditches between the vegetable gardens. Phosdrin, in the eyes of those who raise both fish and vegetables in Thailand, is indeed twice best.

Phosdrin

Trade Mark.

new systemic Shell insecticide

Phosdrin is the sixth in the series of Shell pesticides. In addition to its uses on vegetable and fruit crops, it has potential applications for the control of insects and mites on forage crops, tobacco, cotton and ornamentals. If you have a pest problem in your area, consult your Shell Company. Between them, aldrin, endrin, dieldrin, Phosdrin, D-D and Nemagon offer control of almost every significant pest.

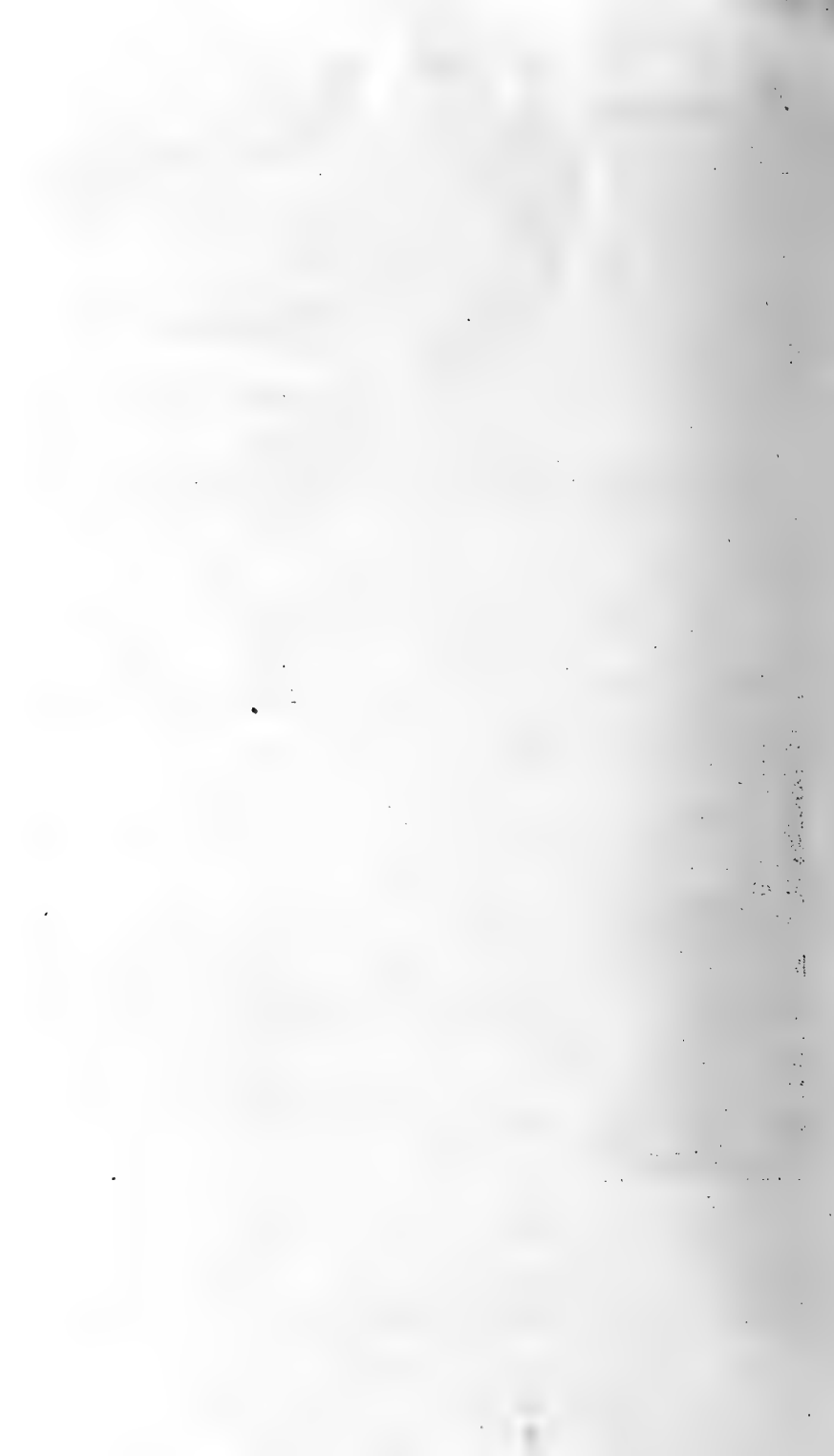


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AND JOURNAL OF VARIATION

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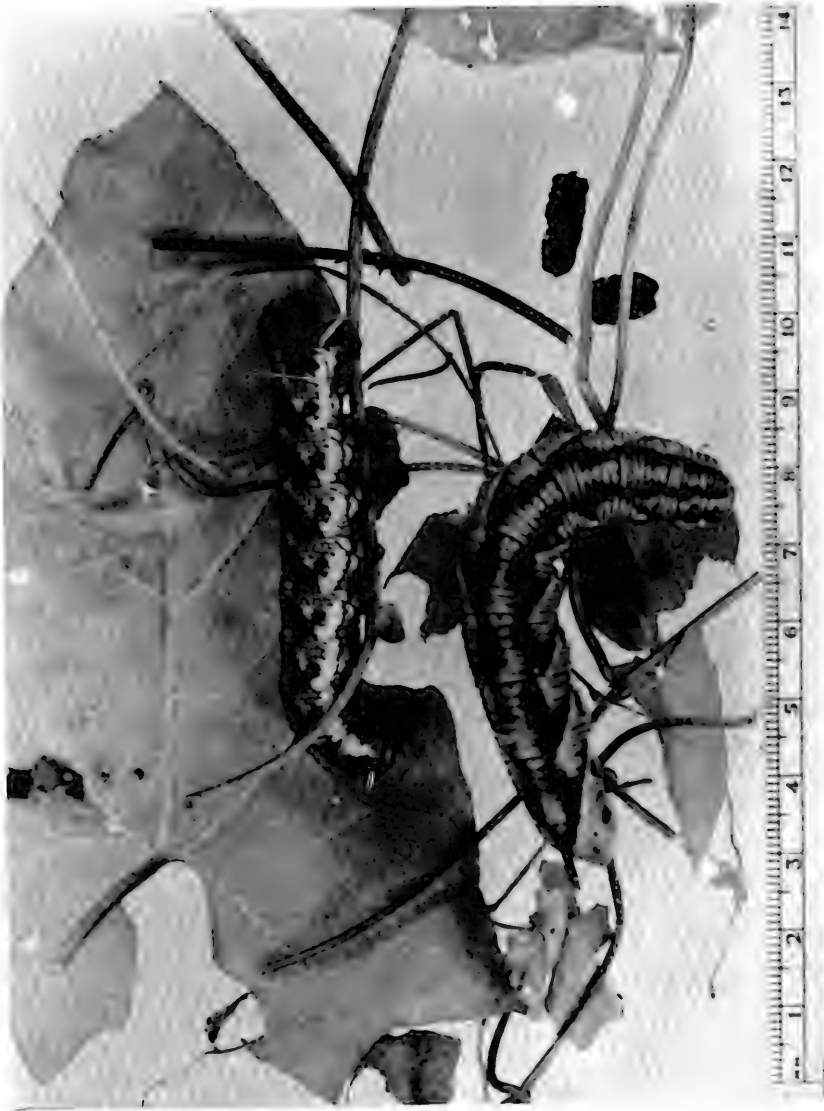
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(b)

HERSE CONVULVULI L.

Further Observations on Rearing *Herse convolvuli* L.

(Reported *Ent. Rec.*, **66**: 262.)

By C. M. R. PITMAN.

No excuse or apology will be offered for writing this elementary paper apart from the fact that much time has been spent wading through old and new entomological literature in unsuccessful efforts to find comprehensive descriptions or details concerning the early stages of this species in this country, and in view of the meagre information available concerning *Herse convolvuli* L. it was considered that the following observations might be of interest to anyone fortunate enough to possess a female or young larvae of this species. However, as the capture of the moth at Salisbury on September 9, 1954, and its subsequent behaviour in captivity, together with the record of egg laying and suggested infertility, have already been described (*Ent. Record*, **66**: 261), this article will deal only with the rearing and management of the two larvae which actually hatched: of the 19 ova two hatched, two larvae died in the egg, and 15 were infertile. In these foregoing remarks it will be timely also to mention the great impression made by consistent dissimilarity in colour, size and characteristics of these two larvae.

For convenience, throughout this paper the larvae will be referred to as (a) and (b) respectively, (a) hatching on October 4th, and (b) on October 5th. As soon as they hatched, the small larvae were placed in test tubes 6" \times $\frac{3}{4}$ ", closed at the mouth with a plug of cotton wool. However, in a very short time the danger of this practice became evident when one of them was found struggling in the loose ends of the plug, and it was at once evident that this would soon have been fatal had the young larva not been rescued forthwith by extracting the part of the wool where the larva was entangled, and laying it on a fresh convolvulus leaf, allowing the larva to free itself, which it did after some violent contortions. The lesson was learned, however, and henceforth the plugs were covered with a piece of fine muslin.

Each larva was given fresh convolvulus leaves daily, small ones for a start increasing the size as their appetites warranted. In these early days, the larvae preferred to feed at night, eating very little, if at all, during the day and not stirring for long periods from the underside of the midrib of the leaf, where they spent most of the day resting. In this position they were very difficult to see on account of their coloration.

For the first few days of their existence, growth was very slow. When hatched, they were approximately 3 mm. long, dull whitish green in colour, with rough skin and a slightly curved pale greenish horn tipped with black, both larvae at this stage corresponding to this description. By the end of the first week (a) had attained a length of about 6 mm. with (b) slightly smaller, and both ate very little at this stage. On October 14th (a) had become quiescent and prepared to moult and (b) did likewise on 15th. By October 16th, twelve days after it had hatched, (a) had passed through the first moult successfully and in its new skin was light green in colour with black horn and small black

spiracles with a row of black dots above them and seven whitish oblique lines along each side, with the skin a little rougher than before. After moulting it was transferred to a slightly larger tube, 7" \times 1". On October 17th, (b) had also completed its first moult safely and looked very much the same as (a), but the spiracles were deep green with no spots above them, the oblique stripes almost invisible, and the horn brownish. It was also moved to a 7" \times 1" tube.

For the next few days their appetites increased, eating voraciously; they grew to 16 mm. and were again moved to larger test tubes. By now they were feeding both day and night, but still continued to rest along the midrib of the leaf. On October 19, the larvae again became quiescent and only three days after their first moult, prepared to do so again. During the night (a), now 15 days old, had completed its second ecdysis, and appeared in an entirely new form with very rough pale apple green skin, the horn green, tipped with black, which had turned all black before the next moult; the spiracles were bright orange ringed with black, and the black dots above them were much longer and more distinct. The oblique stripes on the sides were of a darker green and edged inwardly with white. (b) did not undergo its second moult until October 22nd when it was 17 days old, and (b) also had undergone a marked change when the ecdysis was completed. It was not much darker in general colour, the spiracles were dark green ringed with white and the horn brown, remaining brown. The oblique stripes were dark green with paler green edging.

On 23rd, both were feeding continuously; (a) had become 1 $\frac{3}{4}$ " to 2" long and (b) 1 $\frac{1}{4}$ " to 1 $\frac{1}{2}$ ". As before, when not eating, the larvae adopted the resting position under the leaf, moving very little indeed apart from reaching from one leaf to another when feeding. Never at any time did they become restless or inclined to wander and unless disturbed rarely moved until they had eaten the leaf on which they rested. Very rapid growth was now noticeable in both larvae, and (b) was becoming much darker than (a), but still smaller, and the skin appeared to be much rougher. At the beginning of their third week as larvae they prepared to moult again, (a) on 25th completing the ecdysis by 5.30 p.m. on 27th. The larva was now 23 days old, having undergone another very remarkable change, being a lovely rich green with smooth skin, heavily marked on its first four segments with two rows of black dots. Thick heavy oblique lines joined together on the back; the spiracles were large and jet black, the horn brown, tipped black, anal claspers black, and the anal segment gave the impression of being very horny. The head was striped with a black line on each side. As soon as it commenced feeding, it was placed in a tube 8" \times 2 $\frac{1}{2}$ ". (b) was now growing much faster, the stripes along the sides were becoming darker, and small mauve spots were beginning to appear above the spiracles. It took up its position for the next moult on 27th October. During the night of October 29th (b), now 24 days old, had passed through the third moult without mishap, and appeared in an entirely different colour from (a), showing hardly any green at all. (a) still feeding voraciously was now about 2 $\frac{1}{2}$ " long, and the markings had become much better defined. It was feeding day and night, and had become much more active, but made no attempt at concealment or wandering away from the food plant.

The colour of (b) was now shades of brown, being much darker on the back, and whitish below the spiracles. The horn black and markedly curved; the oblique stripes dark brown to black edged broadly with white on the inside; the spiracles black ringed with white, and the head brown with black stripes on each side. At first glance, it was very similar to the brown form of *Deilephila elpenor* L. When feeding commenced, it was also placed in a large tube. (a) had now become about 3" long with an enormous appetite, whilst (b) was very noticeably much slower in its appetite and growth. On October 31st, (a) was becoming very big in circumference as well as length; its eating was colossal, but fortunately a large supply of *Convolvulus* had been gathered which proved to be a timely precaution in view of a keen frost on October 30th, which completely defoliated the supply of food plant out of doors. This was stored satisfactorily in a jug of water, kept in a cool room, and it lasted long enough to supply the full needs of the larvae.

It was now to be noticed that the larvae had become very sensitive to a shadow falling over them, and also to a sudden noise near to them, and ceased to eat when either of these interruptions occurred. When they were about 3"/3½" long, the larvae were removed from the large tubes and placed in glass topped cardboard boxes of bigger dimensions to await the final moult. Upon being disturbed, the larvae varied in their reactions, (a) assuming a semi-curved position, while (b) favoured a horizontal pose with the head inclined slightly downwards; never once did either take up the sphinx-like attitude which is so characteristic of *Sphinx ligustri* L.

During the fourth week, now early November, the larvae were feeding continuously throughout the day, often eating eight or nine large convolvulus leaves daily; the droppings were very large, and on November 2nd, between 7 a.m. and 6 p.m., (a) passed twelve pellets ranging from ½" to ¾" long. It has become much darker in colour and the black markings were spread over a much greater area; the spots on the 2nd, 3rd and 4th segments had coalesced into stripes along the sides and it still continued to rest in the semi-curved position; while (b) favoured the straight out attitude, and never once did (b) behave as (a) in this or any other characteristic.

Both larvae were now becoming much more active during the day. On November 6th (a), now being about 4¾" long, did not feed quite so much and seemed to be preparing for the 4th ecdysis, which event was awaited with excitement to see what further change would occur. It caused much surprise when it refused food and started to wander round the box as though seeking suitable quarters for pupation, whereupon it was placed in a final breeding cage made of perspex and filled with sterilized friable earth and after several abortive attempts at burrowing it eventually entered the soil during the evening, and finally disappeared by 9 o'clock, burrowing through 3½" to 4" of soil to the bottom of the cage where, on November 9th, 37 days after hatching, and still in its third instar it had formed an earthen cell 2½" long and 1½" wide between the earth and the floor of the cage, observation being possible as the bottom of the cage was also of perspex.

All this while (b) was still feeding fast day and night, but failed to reach the proportions of (a). By November 9th, it had grown to 4½" and appeared to be full fed, eating very little on that day, and it

wandered a little and with more wandering on 11th, became lethargic towards the evening, and like (a) gave the appearance of preparing for an ecdysis, but on 12th it started roaming again, this time in real earnest, so it was placed in the prepared breeding cage. It was then noticed that the skin had become harsh and was showing a green tinge underlying the general brown ground colour. It had now been without food for three days and continued wandering about the earth without making any attempt to enter it so some moss was placed in the cage, thinking that this might appeal more to the larva, but this failed, and a fresh supply of earth was treated with contempt. The larva steadfastly refused to be persuaded to act other than according to its inclinations, refusing some ready-made burrows. Obviously, it was of an independent nature and refused to be hurried; this state of affairs continued all day on 13th November, and anxiety was being felt about its future. It was indeed very fastidious in its choice of a place for pupation, and was obviously dissatisfied with the present conditions so it was taken from the cage and placed in a temporary box for a short time, but only to give it a change of scenery, as it was desirable that pupation should take place in the final rearing cage which was 18" long by 6" by 6", divided into halves with perforated zinc. As it was built of perspex, it offered the best conditions for observation. It was also suitable for keeping the insects in the right condition for forcing early emergence should such procedure be deemed necessary. As (a) had already gone down successfully in one partition, it was earnestly hoped that (b) would do the same in the other.

However, in spite of another fresh supply of earth, it again refused to enter for pupation, and it was taken out, and the sides of the cage lined with cardboard. On returning the larva to the cage it at last seemed satisfied and after wandering once or twice round the cage, it started burrowing and by 10 p.m. it had gone down to the bottom of the cage to complete pupation and like (a) it was only in its third instar. By 14th November, 40 days after hatching the making of the earthen cocoon was visible on the bottom of the cage. The interior of the cell of (a) was plainly visible at the bottom of the cage and observations were made regularly, when the larva might be seen rolling within, making the walls of the cell smooth and hard, but it did not finally pupate until the morning of November 23rd, after being in the cocoon for 17 days.

Notes on the Microlepidoptera

By H. C. HUGGINS, F.R.E.S.

EUZOPHERA TEREBRELLA Zinck. In the past, I have always associated this moth with the common spruce, and my friends who have taken it have had the same experience. Barrett gives the spruce and Douglas fir as its foodplants, but although the Douglas fir is well suited to it I have never found the larva infesting its cones. Whilst I was on Tresco in the past two years I took several *terebrella* in the Abbey gardens at light. This came as a great surprise, as there are no spruces or soft-coned pines on the island, and the feeding habits of the larva, of which I must have seen hundreds in the 'twenties, seem

only suited to these, and not to the hard-coned sorts grown on the island. The egg is laid about mid-summer as a rule, on the young green cone, and the larva almost immediately aborts this so that it grows less than one third of the usual size, and the scales do not lie smoothly, but curl up at the edges. The cone usually falls in the first winter, and the larva feeds in it on the ground for another year, and under the thick cover of the spruces the cones remain sufficiently damp to remain eatable. How this life history can be adapted to the huge hard cones of the pines grown on Tresco is difficult to conjecture. Perhaps a visitor in spring may be able to find out.

AGERIA VESPIFORMIS Linn. Most people associate this clearwing almost exclusively with oak, and certainly it is most easily obtained by digging the larva from the bark of two or three year old oak stumps. It does, however, feed on a variety of other trees, and I have bred it from elm, birch, and sweet chestnut. In 1934 and 1935 there was a large colony feeding collectively in a kind of boss about five inches long by three deep on the trunk of a balsam poplar in Chalkwell Avenue, Westcliff on Sea. This boss had apparently been formed by the attacks of the larva on the trunk of the young tree and there were at least a score of larvae in it each year. However, their efforts were obviously causing an unsatisfactory growth and in the winter of 1935/6 the Parks Superintendent had it rooted up and replaced. This whole infestation was so unusual, both as regards the species of tree and method of feeding that I did not consider the balsam poplar as an ordinary food, but this year, to my surprise, I found at least a dozen old mature trees in a different part of the town to be infested. In these cases, however, there was no sign of gregarious feeding. The pupae were sticking out of the burrows singly in those knobs formed on the trunk by the removal of side shoots, and I fancy the eggs were laid in ones and twos at the most in the wounds where these had been hacked away.

65 Eastwood Boulevard, Westcliff on Sea, Essex.

Lampropteryx otregiata Metc. in Wales

By R. FAIRCLOUGH

We all kick ourselves metaphorically at times about our collecting mistakes. After the war I found myself with one specimen of this species taken on 31st July 1942 at Pencader in Carmarthenshire. It had been caught in a small area of rushy ground in the river valley and set as a queer variety of a Carpet. When I realised the identity of the moth I knew I had seen others there, and had the impression that I had also seen the moth in similar situations in the western part of the county. A visit by day to Pencader at the end of July 1950 drew a blank and I wondered if my impression that the moth was common had been a false one.

As we were to spend a fortnight in Merioneth this year I determined to keep a look out for this species, but it was not until towards the end of the holiday, on the 6th August, that I saw a likely looking spot in a river valley on the Montgomery-Merioneth border. There was no sign of the moth by day, but my son and I returned with hand

lamps in the evening to find that *otregiata* was there indeed, though in a rather worn condition. They flew freely over the rushes from 10.15 to 10.45 B.S.T. and we caught at least fifty trying to find some worth setting.

On the following day we were on the Montgomery-Cardigan border catching *Epirrhoe tristata* Linn., and among other moths put up were two *otregiata*, despite their reluctance to fly by day. We finished the holiday by returning on the last evening to the first place to catch some females for ova. As we returned, we stopped by a rushy field in Merioneth near where we were staying to see if the moths were there. They were, my son catching one on the roadside as soon as we lit the lamp, and more being seen inside the field.

Some attention was paid to the flora of the marshy areas in which the moth flew. I had thought that marsh bedstraw was a probable foodplant from memory of the Carmarthen localities, but we could not find this plant in the places in which we found the moth this year. When the ova hatched I gave them heath bedstraw, trefoil, lesser stitchwort, cinquefoil (all of which were common where the moths were flying) plus knotgrass and chickweed. The larvae would eat only heath bedstraw, and friends to whom I sent ova lost the larvae having tried other plants including hedge bedstraw and goosegrass.

I now feel certain that *L. otregiata* is widespread and locally common in the four counties I have mentioned, and probably in Pembroke too. I hope other collectors will find out how far north and east its range extends.

Blencathra, Deanoak Lane, Leigh, Sy. 31.8.59.

A Fortnight's Collecting at Aviemore in August 1959

By L. E. SAVAGE.

On 7th August 1959, I left Hove with my wife just after 5 a.m. for the north and by 6.55 a.m. had broken the North Circular Route at Mill Hill, thus encountering very little traffic through London. We reached our first night's stop via the Great North Road at Lauder, Berwickshire, during the evening and continued our journey in the morning for a distance of 27 miles to Edinburgh where we decided to visit the castle. Decorations and staging were in course of erection for the coming festival. From there we made for the Forth bridge ferry, which, owing to a queue of vehicles at the quayside, delayed us so that we failed to meet our friends at Perth in time for lunch. It was interesting to note that progress had been made on the new road bridge across the Forth, a tall brick entrance pylon having been partially built, with three small cranes on the top, on the north side, with an improvised roadway stretching across the rocks and water to the first pylon, lorries running between the two points. We arrived at Philip Le Masurier's hotel at Aviemore in time for a very enjoyable dinner, following which, as the weather was fairly propitious, I set out with the m.v. outfit in company with Mr. A. J. Wightman to get *Triphaena sobrina* Bdv., an insect which had so far eluded me. We selected a spot with plenty of Bilberry around and were rewarded by taking a few, although not in

perfect condition, as I understood from my companion that the insect had been about for a week, bad weather having prevailed. A few *Enargia paleacea* Esp., *Amathes agathina* Dup., *A. depuncta* L., *Euxoa nigricans* L., and *Parastichtis suspecta* Hb. also turned up with some nice forms of *Lygris populata* L.

The following night, we repeated our efforts at the same ground and had much the same results with the addition of *Lithomoia solidaginis* Hub., *Hydraecia oculatea* L., *Stilbia anomala* Haw. and *Crocallis elinguaris* L. Sugar produced a few *suspecta* and *solidaginis*. On 10th August, we had a very hot day followed by a hot night, so we changed our tactics from the woodlands to a more open site with sandy soil, and heather and grasses growing around. Here we never had a dull moment from "the dance of the antlers" at the commencement of the m.v. light throughout the following three hours. *Agrotis vestigialis* Hufn., *A. agathina*, *Amathes castanea* Esp. with its many shades from pink to red, *E. nigricans*, *Diarsia dahlia* Hb., *Amathes glareosa* Esp., and *Euxoa tritici* L. were very common. *Aporophyla lutulenta* Schf. (*lunenburgensis*) was not common, but I took three, and *Amathes xanthographa* Schf. was not common as we know it in the south of England, but some very fine dark shades through red to almost black occurred.

I was particularly pleased to take three *Actebia praecox* L. which has been reported previously by Commander Harper from this district. In the day-time, *Antitype chi* L. was beginning to appear on the posts in perfect condition and again at night at both sugar and light. The following two nights were devoted to sugaring the posts along the golf course, and I found *L. solidaginis* to be the most common moth with *A. castanea*, *P. suspecta* and *D. dahlia* being common. On 13th August and for the following four days, we tasted some of the very high winds for which Aviemore is noted and we confined our activities mainly to the sugaring posts, which now began to show fresh emergences of *Aporophyla nigra* Haw., *Anchoscelis litura* L., *A. chi*, *Cirrhia icteritia* Hufn. (ab. *flavescens*), *Dryobotodes protea* Schf., *H. oculatea*, and *Anchoscelis helvola* L. with the odd *E. paleacea*; this last named moth, which I believe can be very common, was rather spasmodic in its appearance, and certainly very skittish on the sugar.

During the second week's collecting the moon was full, but often much cloud obscured it and the high winds had abated, and, although the temperature was high, it was interesting to note that on these hot nights there was a dearth of moths appearing at the sugar and also the m.v. light did not have its usual attraction. On my last night, the 21st, the sugar was even worse, and I almost decided not to put up the m.v. light, particularly as there was an impending storm. However, as Mr. Popham, who had been out with me sugaring, was quite keen to make the trip, we set out for the open space we had been accustomed to visit, and for some twenty minutes after setting up the light, the results were nil. Suddenly a galaxy of moths arrived, and we were boxing as fast as we could. Coinciding with the arrival of the moths was the arrival of several caravanners from the district whose curiosity had at last sprung into action after seeing the blue lights for the past few weeks. The only thing to do in such circumstances is to sink on to one's knees and box and answer questions intermittently as best

possible, taking care not to let one's eyes wander from the sheet. However, I was able to get several more *A. lutulenta* (*luneburgensis*) and another *A. praecox* and one *Celaena haworthii* Curt., and was well satisfied with my last night's catch. The galaxy terminated as suddenly as it had begun after thirty minutes, the wind blew chilly and damp, the caravanners' curiosity was satisfied, and all returned to their temporary quarters, and we returned to our hotel.

In conclusion, I must say that Philip Le Masurier and his wife really did make it possible in so many ways to facilitate a bugging holiday at Aviemore, every help being afforded to young or old with a smile. Also my wife and I had the very pleasant company of Messrs. Wightman, Gardner, Popham, Waddington and Mr. and Mrs. Lyons, not forgetting the weekly visit of Commander and Mrs. Harper. We left Aviemore at 6 a.m. the following day, reaching home at 10.30 p.m. after a fairly easy journey. 31.viii.1939.

Some Notes on Collecting Stigmellidae (Nepticulidae)

By S. N. A. JACOBS.

The Stigmellidae represent the smallest of the microlepidoptera and no species reaches 1 cm. in expanse, but the family is one of the largest in this country, having well over seventy species represented here. Many of the species are very beautiful, and they have the advantage of enabling the collector to breed in a minimum of space.

October is, perhaps, the best month to start working on this family, for while the species have from one to four broods a year, according to species, the autumn broods are the most abundant, so that a very encouraging start may be made in the first season.

Stainton was much attracted by the family and devoted two volumes of his Natural History of the Tineina to illustrating the life cycles of many species. From time to time, many lepidopterists have worked on this family, and in the 1930's Dr. Hering in Berlin and Mr. Sonderup of Denmark produced books on leaf-miners in general, giving good attention to this family. In 1935, Joseph Klimesch of Linz published a paper in *Lambillionea* (1935, pp. 62-70, 87-96, 116-122) entitled "*Quelques Observations sur le Genre Nepticula Z.*" which did much to revive interest in the family, and an English translation was published in the *Proceedings of the South London Entomological and Natural History Society* for 1936-37. He contacted microlepidopterists in many countries to send him material, which he paid for with identifications and most helpful advice as well as set specimens, and as few collectors could collect such material without developing a close interest in the family, the years following 1935 showed a general revival of interest. Some of the recruits fell by the wayside, being unable to devote the time required, but many stayed the course and are still working on the diverse problems presented by this genus, which give full scope for the enquiring nature which is an essential part of the good entomologist.

Most of the species are attached to trees and shrubs, but many feed on low plants, and all mine, either in the leaves or in the seed vessels.

The egg is usually laid on the under side of the leaf and the larva emerges from the attached surface of the egg and burrows straight into the flesh of the leaf without ever having existed in the open air. The larval mine is made to follow a pattern consistent for each species, and mines may be classified roughly as galleries, spiral mines, and blotch mines, though some blotch mines start as galleries, becoming blotches at a later stage in their development.

A gallery may be said to be a long narrow mine, more or less contorted according to the size of the leaf and the species; a spiral mine is one where the larva makes a gallery wound closely round and round, without leaving any uneaten leaf between the coils, and a blotch mine is one where the larva makes a central chamber and enlarges it by eating in various directions outwards but remaining in the central part of the mine.

The way the frass is deposited in the mine is a very useful point to note for identification of species, and this may be left in a thin or thick central line following the line of the gallery, in arcs across the width of the feeding channel, or in an irregular heap in the centre of the blotch. A gallery with two lines of frass may be ascribed at once to a dipterous larva. One species, *S. subbimaculella* Haw. makes a triangular cell between the midrib and a lateral rib of an oak leaf, and voids the frass through a slit along the lower edge of the mine, thus leaving no frass in the mine.

At the end of the mine, the full-fed larva makes a clear oval chamber, and in the forward edge of this, it makes a small semicircular cut which the collector soon gets to recognise as evidence that his quarry is not at home. Having left the mine, the larva seeks a position for pupation, which is usually among rubbish on the surface of the ground or under a surface stone. It spins a close silken cocoon, usually shaped like a minute oyster shell or a tomato seed, coloured various shades of yellow to reddish brown according to species, and some species spin dark green or blackish silk.

As with the Coleophoridae, it is best not to collect imagines unless they are of very distinct species, and to rely on breeding series from mines collected in the field.

When the larva starts to feed, it seems to attack the leaf in such a way that the feeding area remains green, apparently severing some part of the leaf's circulatory system. The result is that many species may be found by searching among the fallen leaves for those exhibiting green blotches, and this is particularly useful in the case of *S. argyropeza* Zell., which feeds from the top of the stalk of aspen leaves, and usually does not show a mine in the leaf itself until the leaf has been some time lying on the ground. The beech feeding species are most easily found in this way, and some of the oak species, also.

The most satisfactory way to collect mines in the field is with flat tins for the larger leaves and 1" glass tubes for the smaller leaves. It is best to try to avoid mixing the species in the collecting vessels, as larvae often leave the mines before they can be brought home, and it would be much more difficult to separate the species by the larvae than by the mines.

Various people have their own favourite way of breeding Stigmellidae, and the way I favour is breeding them in cheap glass tumblers, preferably with straight-up sides. These I grind at the top by putting a

small quantity of water in them, and turning the mouth of the glass over the spindle of an emery wheel so that the whole surface is ground **at once**; without the drop of water, the glass is apt to flake and give a rough chippy surface, but if wet, quite a professional job in the ground glass line can be made. This ground surface enables the breeder to close the glass with a glass disc on top. Klimesch favours glass tubes about 3 cm. or 3.5 cm. in diameter, but these are difficult to get here and are very expensive, though they are ideal for the purpose.

The pupating medium for the tubes must be one that holds water well but which does not cake, for the minute larvae cannot force their way through too solid a medium, and the most satisfactory medium in my experience is peat moss litter sieved through perforated zinc, and mixed with sand similarly sieved. The mixture should be sterilized in an oven and allowed to cool before being used.

On reaching home, the mines are more carefully sorted into species, and the portion of the leaf likely to include the complete mine is cut out with scissors. Mines hardly ever cross the midrib of a leaf, and the usual portion to cut out would include the midrib, cut close on the side away from the mine, and including the lateral vein below the mine, thus making a wedge-shaped fragment of leaf. About one inch of the pupating medium is placed in the bottom of the glass and moistened with boiled water, and not more than one dozen of these wedges are inserted round the edge, point downwards in the peat, and the tube is then corked, and labelled with a serial number and data of the catch. This number should be entered also in a diary in which details of the mine, including a pressed specimen when the larva has left it, and data are kept.

The vessel is kept corked while the larva finishes feeding but when it has left the leaf, the empty fragment is removed and pressed as mentioned above after first making sure that the larva has not spun its cocoon on the leaf. The majority of the larvae will bury in the peat, some species going as much as the full inch into the ground, but most species spin up just below the surface. When all the leaves have been vacated, the cork is removed from the tube and this is replaced by a square of voile or other such fine material to exclude predators, held in place by a ring of fine copper wire (elastic bands would seem to be best, but they perish very quickly out of doors), and to the copper wire ring, the serial number is attached.

The vessels containing the cocoons should be kept in a rack of the nature of a test tube rack, out of doors in a shady place, and the peat should be kept moist by adding a drop or two of boiled water as required, by means of a pipette, and with a little practice this can be done without removing the voile. The species feeding in rose leaves will appreciate a small piece of crumpled tissue paper in which to construct the cocoon, for in nature it is their practice to spin up at the base of the stalk of the leaf in which they have fed, in the cup-like recess against the stem from which it has grown.

Early in April of the following year, the voile is removed and a glass disc substituted, and a close watch should be kept daily for emergences, and the rose species may be expected to appear first. The favourite resting place for the adult is at the top of the side of the glass where it meets the glass disc closing the tube. The insects are very active and

have a peculiar drunken wobble as they run about rapidly, and are thus easy to damage when boxing them.

The tubes containing imagines are brought indoors and are opened one by one close to a closed window. The moths will fly out on to the glass where they will eventually settle down, and they are then covered by a pillbox, the inside of which has been touched with a paint brush moistened with acetic ether. The anaesthetised insect will drop into the box, and is then in ideal setting condition.

Before leaving the breeding stage, it is as well to mention that three British species, *S. septembrella* Stt. on *Hypericum*, *S. weaveri* Stt. on *Vaccinium vitis-idaea*, and *S. agrimoniae* Frey on *Agrimonium eupatorium*, are in the habit of spinning their cocoon within the mine, and it will be noted that some other species will also be seen to do this, but in their case, it is a sign that the larva is parasitized.

For setting the insects, stainless steel pins not more than three-eighths of an inch long, and .0056" diameter should be used. Setting boards about 2" long can be made by smoothing down a piece of soft cork 1" wide and $\frac{1}{2}$ " thick, papering it, and then, with a steel rule and a safety razor blade, cut out a v-shaped groove not more than three-thirtyseconds of an inch wide at the top, and centred $\frac{3}{8}$ " from the side, so that there is a narrow and a wide side, the extra space on the one side being useful for pinning data labels. The shortness of the board is to allow the boards containing set anaesthetised insects to be placed in a cyanide bottle to kill them before they recover.

The setting of these minute insects should not cause the collector any alarm, and providing the pinning is done carefully the setting is quite easy. These little insects, however, have shells like little crabs on their thoraces, and the use of a dissecting microscope or a medium lens is necessary to do the job well. The pinned insect is then put on the board in the usual way, making sure that the level of the board is just right for the expanded wings to lie flat on it, and a gentle puff from behind will, with a little practice, be enough to put the wings into perfect position. Antennae and forelegs can be lifted into position with a fine setting needle, bent low down, to an angle of 30° from the line of the handle, and the position of the wings may be adjusted with this implement also. Soft paper strips are pinned over the wings in the usual way, and the small size of the insect should not be allowed to tempt the collector to shorten the time on the board, and I recommend a full month.

For mounting, a reasonably stout pin should be used; No. 12 for ordinary cabinets, and No. 3 continental for cabinets with deep enough drawers, and a strip of polyporus used to take the insect pin, and it is best to use two labels, one for the normal data on top, and one for the serial number of the culture below, so that the insect may at any time be related to the mine in the diary without undue trouble.

A collection of mines makes a very useful adjunct to the collection of imagines, and as the disposition of the frass in the mine is a matter of specific importance, it is well that the mines should be mounted so that they may be held up to the light to disclose this feature. The simplest way, of course, is to attach them in a book by means of narrow strips of adhesive paper, but this means unmounting for inspection, and as a modification, the specimens could be placed in small transparent

envelopes in the book, but the *de luxe* method is to mount the specimens between two lantern slide cover glasses ($3\frac{1}{4}" \times 3\frac{1}{4}"$) which give room for two or three leaves and a label for data. Space for the leaf thickness can be made by sticking a $\frac{1}{8}"$ strip of post-card along each edge of the bottom glass to keep the cover glass off, and the whole bound by *passepout*.

The Male Genitalia of the British Stigmellidae (Nepticulidae) (Lep.) by Dr. Bryan P. Beirne, published in the *Proceedings of the Royal Irish Academy*, 1945 (Vol. 50, Sec. B., No. 9) figures all the species known at that date, and although certain features of this paper have been called in question, basically it will be found to be of great assistance to the student of the British Stigmellidae.

Neville Chamberlain's Entomological Diary

By Col. W. BOWATER, F.R.E.S.

We can realise with some gratification that a former Prime Minister of Great Britain was an entomologist, and I have had the privilege of the loan of his entomological diary, which extends from 1886 to 1910, and contains matters of interest to our fraternity, especially the Birmingham members.

As this note is on the subject of the diary itself, no attempt has been made to bring the nomenclature up to date, nor to supply generic names where these are absent.

His start as a collector was an unusual one, pupa digging, but was fruitful, as on 20th February 1887, when he was aged 18, he had 187, from which 75 moths emerged, including *aurantiaria*, *brumata*, *P. populi*, *gothica*, *stabilis*, *instabilis*, *pilosaria*, *plecta*, *thalassina*, and *betularia*.

23rd Feb.—One pupa *S. pavonia minor*, and three others exhumed in Sutton Park.

28th Feb.—Six pupae exhumed at Moor Green (near his home).

18th April.—Eight pupae, Gt. Witley. Notes on breeding *aprilina* follow, and records of larvae taken—*Dromedarius*, *palpina*, *Vinula*, *antiqua*, *libratrix*, and *S. populi*.

August.—*jacobaeae*, *reclusa*, *ziczac*, *caeruleocephala*.

19th Sept.—Dug up 75 pupae from 4 trees below Moor Green Wood, 23, 20, 19, and 13 respectively.

Then follows an account of breeding *B. rubi*, a task which most of us find difficult, but the diary says:—

20th Sept.—Larvae put in cage.

12th October.—Larvae put in hothouse.

5th November.—Eight spun up.

1888.

16th March.—One *rubi* emerged, and another, which had pupated on 13th, emerged on 22nd. Others put in greenhouse on 7th April pupated on 9th, and emerged on 17th. One spun only a few threads, but another is spinning seriously now. Hairs of the larvae come off on the hands, causing considerable pain if not removed. The only way to do this is to scrape them off with a sharpish penknife.

March.—*progemmaria*, *hispidaria*, *munda* emerged. Another *rubi* spun up on 24th, emerged 4th April.

6th May.—Dug up 20 pupae, including *S. tiliae* and *helvola*.

1889.

21st June.—*jacobaeae*, *tiliae*, and *plecta* emerged. And earlier *bilineata*, *pennaria*, *pilosaria*, *P. populi*, *O. lota*, *trapezina*, *satellitica*, *piniperda*, *P. monacha*, *libatrix*, *angularia*.

6th July.—*V. polychloros* larvae (locality not given) emerged 5th August.

August.—Larvae *trifolii*, *pavonia minor*, *vinula*, *reclusa*, *megacephala*, *bifida*, *tragopogonis*, *rumicis*. List of emergences includes *P. machaon*, *verbasci*.

1891.—A few entries, none again until

1897.—*camelina*, *furcula*, *dictaea*, *carpini*, *capsincola*.

1898.—*leporina*, *duplaris*, *lucipara*, *furcula*, *camelina*, *S. populi*. Delamere.

1899.—*quercus*, *menyanthidis*, *porphyrea*, *betulae*, *W. album* Bryn. Cardiganshire (an uncle's country house.) Larvae *pruni*, *betulae*, *W. album*. B. Wold.

7th October.—“To Droitwich, cycled along Worcester Road, then towards Ombersley and home; only 11 pupae, stiff clay” (over 50 miles).

1900.—Larvae on low plants: *fimbria*, *nebulosa*, *brunnea*, *obscurata*. Ilngollen.

29th April.—Larvae *fimbria*, Stratford Road. Received ova *croceago* from P. W. Abbott.

27th May.—*leporina* on paling, Cadbury's field. *cynipiformis* Wyre. *lunestris* Stratford.

30th July.—*atropos*, one full-fed larva taken by J. A. Kenrick on roadside, Stourport.

23rd Sept.—Three ova *lunosa*, one survived the winter, emerged 28.8.01.

1901.

15th June.—*versicolor*, 10 larvae on birch, Wyre. Placed in hothouse, emerged 28.1.02.

19th Sept.—Larvae *fuliginosa*, Longwynd.

1902.—*U. carmelita*, Glen Rossal, and ova *occulta*.

4th July.—*U. or*, two, King's Norton.

1903.—*T. pruni*, 9 larvae, Ashton Wold.

1904.—Absent in India.

1908.—Larvae *bidentata*, Cannock Chase. *strigillaria*.

1910.—*P. moneta* larvae on aconite, Garden, Highbury (his father's house, Moor Green, 1½ miles from Birmingham Town Hall), emerged 20th Sept.

April.—*zonaria*, dwarf willow, Wallasey. *hispidaria*, Richmond Park.

May 17th to 23rd—*ilicifolia*, Cannock Chase.

30th May.—*chrysorrhoea* larvae on sea buckthorn. Deal. Percy Reid, *Ent. Record*, XIII, p. 131.

23rd June.—*fluctuosa*, *ocularis*, *tincta*, *contigua*, Wyre. *Ent. Record* p. 263. *Ent.*, 463, pp. 362/3, *minos*, N. Wales. *geryon*, Malvern.

10th June.—*bombyliiformis*, *fuciformis*, *alternata*, Matley Bog, New Forest.

Hints for localities:—*paniscus*, Bedford Purlieus.

A. crataegi, the station is Addisham; the village, Ash.

Finally:—May to August, lists as *Lepidopterist's Calendar*.

To comment on the foregoing entries in the diary, quoted verbatim, it would seem that enthusiasm for pupa digging was maintained, and much time and care given to rearing larvae. In the latter days, widespread localities were visited in Wales and Scotland. The hothouse mentioned was his father's famous orchid houses.

The finding of 10 larvae of *versicolor* at Wyre was a worthy effort, as was the taking of *pruni* larvae. The note on *A. crataegi* is also interesting.

The brief note, "May 17 to 23, *ilicifolia*, Cannock Chase", sounds as if this famous species was prevalent then.

Only one specimen, a male, is in the collection, which was presented to the Birmingham City Museum after his death in 1941.

It was a wedding present from Dr. Richard Freer, of Rugeley, on 5th January 1911, and the data label is:—

Cannock Chase
March 1899
+ larva
R. Freer.

There is only one specimen of *Cucullia absinthii* Linn. without data, but it may be the one which he recorded taken at Bryn.

I well remember his attendance, usually with his uncle, Sir George Kenrick, at meetings of the Birmingham Entomological Society, before it was absorbed in the Birmingham Natural History Society in 1908.

The diary was kindly lent by Mr. L. Bilton, Keeper of Natural History, Birmingham City Museum and Art Gallery.

Further Notes on *Hyponomeuta irrorella* Hb.

By S. WAKELY

Towards the end of May, accompanied by Mr. L. T. Ford, I visited the locality in north west Kent where we had taken this moth the previous year. Our aim was to try to find larvae and to rear the moth. On arrival at the spot where the spindle bushes grew we found *Hyponomeuta* webs in great abundance containing larvae in various stages of growth. The difficulty was to decide which were *irrorella* among what were obviously swarms of *H. cognatella* Hb. which we knew abounded there. A long time was spent examining larvae under a lens in an attempt to discover some marking or colour difference which could give us a clue but we had to admit failure. That both species were here mixed up was certain, so sundry larvae were selected more or less at random, but preference was given to solitary larvae or groups of three or less. Samples were also taken from some of the large nests of larvae in order to make doubly sure.

The larvae varied considerably in ground colour from almost white to dark grey; the markings also varied somewhat, but this appeared to be a matter of different instars.

Within a fortnight several of our larvae had pupated in the typical *irrorella* manner, with the striking yellow and black pupa visible under a few strands of silk in a manner reminiscent of *Abrazas grossulariata* L., which is a much larger species, of course.

On 13th June we visited the locality again on the occasion of the field meeting of the South London Entomological and Natural History Society. Very few larvae were left at this date, but by searching the undersides of the leaves of various trees and bushes growing under or adjacent to the spindle bushes, numerous pupae of *irrorella* were found. It was quite hard work, as most were found in dense thickets of hawthorn which surrounded old spindle trees. The pupae were found at heights varying from five or six feet, down to almost ground level.

Subsequently a more productive spot was found where a large maple tree spread its lower branches below an unusually tall spindle bush. The larvae had descended from their foodplant and had found the undersides of the maple leaves exactly right for pupation purposes, and by twisting these branches over, the pupae were easy to see. Others had taken up positions lower down on bramble leaves, but the leaf of any tree adjacent to spindle bushes appeared to be accepted for pupation.

The pupae of *H. cognatella*, which were enclosed in a dense white cocoon, were to be found a few inches from the ground in clumps of up to twenty, all spun together in a mass, although an occasional isolated cocoon was seen.

From this account, it will be seen that *irrorella*, although not nearly as numerous as *cognatella*, is far from being a rarity in this particular locality. One feels that it must still exist in other similar localities, only awaiting discovery. The easiest way is undoubtedly to search for pupae about the third week of June, examining leaves of any tree growing under an old-established stand of spindle bushes. In my experience, they seemed to flourish on the older trees, the leaves of which get into a very sticky state as a result of the large numbers of aphids which attack them, but which do not seem to worry the larvae at all. However, I understand that some pupae were, in fact, found on the younger and more luscious growths which do not appear to suffer so much from the infestation of aphids.

In my article in the March number of the *Record* (*antea*, 61-63) I mentioned that I had obtained ova. The small egg mass which I had examined and broken open in September contained live larvae which perished soon after the envelope containing the eggs was ruptured. The other egg masses which had been kept outdoors all the winter were difficult to find in the spring, and those which were examined in April contained minute dead larvae. They appeared to be surrounded by a fine white dust which, I think, was the frass resulting from their trying to eat the dead bark of the twig. It seems possible that this is what they do in spring, gaining enough energy from this to enable them to break out and start feeding in earnest. Unfortunately mine were on a dead twig very different from the sappy nature of a living stem. That they will eat the twig is certain, as some of the larvae brought home ate not only the leaves but all the rind of the stems as well!

Mr. A. Aston has called my attention to a record of *H. irrorella* in the *Transactions of the Suffolk Naturalists' Society* for 1940, when

a specimen identified by Claude Morley was taken by J. Goddard at Billingford, Norfolk (near Oakley, Suffolk). It was netted at dusk in July 1940.

The difference between the larvae of *irrorella* and *cognatella* is described in *Die Larvensystematik einiger Kleinschmetterlings-Familien* by K. Werner, and is a matter of chaetotaxy.

Lepidoptera of Lech-am-Arlberg, August 1958

By D. G. SEVASTOPULO, F.R.E.S.

The present paper may be read as a continuation of Lt. Col. Carter's *The Alps in 1957* (1958, *Entomologist's Record*, **70**: 61-65, 127-131 and 153-156.

I reached Lech on the 31st July and left on 16th September. The weather during this period was generally fine and sunny with occasional showery days. There was a heavy white frost on the night of the 25th August, with falls of snow on the higher mountains, and from then onwards the nights were generally cold and, although the sun shone, the day temperatures were appreciably lower.

All collecting was done within walking distance of Lech itself, except for a trip to St. Anton on the 4th September. This trip was, unfortunately, unproductive as the weather clouded over soon after arrival and nothing was flying except *Pieris rapae* L. and a single *Hemaris fuciformis* L.

No serious attempt was made to collect at night, but a light outside the hotel was visited every morning early and anything interesting that had been attracted was taken.

The following is a complete list of the species met with:—

RHOPALOCERA

PAPILIONIDAE

Papilio machaon L.—Two in rags. I was obviously much too late.

Parnassius apollo L.—Carter writes, "Common but not found in Arlberg". He was obviously too early as I found it fairly common from the second week in August.

PIERIDAE

Pieris brassicae L.—The least common of the genus. *P. rapae* L.—Very common. *P. napi* L.—Very common.

Anthocaris cardamines L.—Three worn males. Early August is surely a late date.

Gonepteryx rhamni L.—Common. One of the few butterflies I have seen feeding on orchids, in this case *Habenaria conopsea* L.

Colias phicomone Esp.—Very common. *C. croceus* Fourc.—Common. *C. hyale* L.—Common. *C. australis* Verity—Common.

SATYRIDAE

Erebia ligea L.—Common. *E. euryale* Esp.—One rather worn example, probably too late. *E. melampus* Fuessl.—Very common. *E. epiphron* Knock—Very common. *E. aethiops* Esp.—Very common. *E.*

medusa Schiff.—One only. *E. manto* Schiff.—Very common. *E. tyn-darus* Esp.—Common. *E. pronoe* Esp.—Very common.

Oeneis aello Hbn.—A single male found drowned in a stream towards the Wosteralp.

Dira maera L.—Fairly common.

Coenonympha satyrion Esp.—Common.

NYPHALIDAE

Vanessa atalanta L.—Common. *V. cardui* L.—Common. *V. antiopa* L.—One seen and one caught. I was surprised by its flight, I had expected something fairly swift, not a slow glide rather like a *Neptis*.

Polygonia c-album L.—Common.

Aglais urticae L.—Very common. Most examples tending towards *v. turcica* Stgr. with the yellow patch on the inner margin obsolete and the two central spots much reduced. Larvae, of all sizes, abundant on nettle.

Inachis io L.—The least common of the group.

Euphydryas cynthia Hbn.—A single female.

Melitaea britomartis Assm.—A singleton.

Mesoacidalia charlotta Haw.—Common, a good deal of very minor variation, but nothing striking.

**Argynnis niobe* L.—Two males only of the *nomino*-typical form, but *f. eris* Meig. common.

Clossiana euphrosyne L.—Two males only, both rather worn. Presumably too late for it.

**Brenthis amathusia* Esp.—Common.

Boloria pales Schiff.—Very common. *B. napaea* Hffmg.—Very common.

Issoria lathonia L.—A few in mid-September.

LYCAENIDAE

Palaeochrysophanus hippothoe L., *eurybia* O.—A single very worn female.

Aricia agestis Schiff.—Very common. Underside variation very little, although I got one nice almost obsolete male.

Albulina orbitulus Prun.—Fairly common.

Cyaniris semiargus Rott.—Common.

Polyommatus icarus Rott.—One male only.

Lycaena pheretes Hbn.—Fairly common, no females seen.

Lysandra coridon Poda—Very common. No underside variation at all.

HESPERIIDAE

Pyrgus carthami Hbn.—Common.

**Hesperia comma* L.—Common.

HETEROCERA

ZYGAENIDAE

Zygaena achilleae Esp.—Fairly common. *Z. transalpina* Esp.—Fairly common.

ARCTIIDAE

Setina irrorella L.—Three males kicked out of grass tufts.

Parasemia plantaginis L.—Fairly common, usually kicked out of herbage. In addition to the *nomino*-typical form, ff. *hospita* Schiff and *matronalis* Frr. were taken.

Diacrisia sannio L.—One male kicked out of herbage and a second at the hotel lights.

LYMANTRIIDAE

Dasychira fascelina L.—One male at the Hotel lights.

LASIOCAMPIDAE

Eriogaster lanestris L.—Larvae common. Pupae all died.

Trichiura crataegi L.—One male at the Hotel lights.

Malacosoma alpicola Staud.—Fairly common.

SPHINGIDAE

Macroglossum stellatarum L.—Fairly common.

Hemaris fuciformis L.—A single male at St. Anton.

Celerio lineata L., *livornica* Esp.—Rare.

Hippotion celerio L.—A sight record by my sons only. They were definite that what they saw was not *livornica*, and they know *celerio* from Africa.

NOTODONTIDAE

Olostera pigra L.—Larvae very common, the imagines emerging successfully in Mombasa.

Cerura furcula Clerck—Larvae fairly common, the imagines emerging in Mombasa. *C. bicuspis* Bkh.—A doubtful record based on a single larva found on Alder. The imago failed to emerge.

Dicranura vinula L.—Three larvae found on *Salix* spp. One pupated successfully but the imago failed to emerge. The other two larvae refused to eat any of the *Salix* spp. growing near East Grinstead as well as both Poplar and Aspen, and died.

Notodonta ziezac L.—One male at the Hotel lights. Larvae common and varied, the imagines emerging successfully in Mombasa.

DREPANIDAE

Drepana lacertinaria L.—Larvae common on Alder. All pupated but only one emerged in Mombasa.

NOCTUIDAE

Apatele rumicis L.—Larvae common, but only one imago emerged in Mombasa. *A. auricoma* F.—Larvae fairly common, but only two imagines emerged in Mombasa.

Agrotis ypsilon Rott.—Two kicked out of herbage.

Rhyacia ravida Schiff.—One at the Hotel lights.

Diarsia festiva Schiff.—One at the Hotel lights. *D. umbrosa* Hbn.—Two at the Hotel lights. *D. cuprea* Schiff.—Common at the Hotel lights and very common feeding on flowers by day.

Eurois occulta L.—One at the Hotel lights.

Ceramica pisi L.—Two larvae, but the imagines failed to emerge. *Polia glauca* Kleem.—Larvae very common, but only one imago emerged in Mombasa.

Cerapteryx graminis L.—Common at flowers by day.

Cucullia lucifuga Schiff.—Young larvae common but heavily parasitised. They are striped, not unlike the larva of *C. pisi*, and quite different from the adult, orange-spotted, black larva. Imagines emerged successfully in Mombasa.

Bombycia viminalis F.—A few at the Hotel lights.

Trigonophora meticulosa L.—A few at rest.

Phytometra bractea Schiff.—Not uncommon flying by day and at the Hotel lights. *Plusia gamma* L.—Common flying and also at the Hotel lights.

Scoliopteryx libatrix L.—Larvae fairly common, the imagines emerging before I left Austria.

GEOMETRIDAE

Ellopis prosapiaria L., f. *prasinaria* Hbn.—A single female at the Hotel lights.

Crocallis elinguaris L.—Two males at the Hotel lights.

Alcis repandata L.—Fairly common at rest and also at the Hotel lights.

Gnophos obfuscata Schiff.—Common at rest on rocks. *G. dilucidaria* Schiff.—Very common at rest on rocks. *G. glaucinaria* Hbn.—Three females at the Hotel lights.

Psodos quadrifaria Sulz.—Fairly common flying in sunshine.

Thamnonoma brunneata Thunbg.—Occasionally beaten out of bushes on the hillside.

Oporinia autumnata Borkh.—Not common at the Hotel lights and sometimes beaten out of bushes.

Lygris populata L.—Commonly beaten out of bushes on the hillside.

Colostygia aptata Hbn.—Rarely at the Hotel lights.

Cidaria truncata Hfn.—Very common at the Hotel lights. *C. fulvata* Forst.—A single male beaten out of bushes.

Entephria cyanata Hbn.—Fairly rare at the Hotel lights. *E. caesiata* Schiff.—Common at the Hotel lights and also beaten out of bushes.

Xanthorrhoe montanata Schiff.—A single female beaten out of bushes.

Eulype hastata L.—One very worn female flying in the sun.

Coenoteophria verberata Scop.—Very, very common at rest on tree-stumps in wooded areas. Also common at the Hotel lights.

Hydriomena furcata Thunbg.—Common at the Hotel lights, mostly females.

Eupithecia sobrinata Hbn.—A single female at the Hotel lights.

Ortholitha limitata Scop.—Common in the grassy meadows.

Anaitis praeformata Hbn.—Common at the Hotel lights.

Odezia atrata L.—Common flying in the sunshine over grassy meadows.

Readers may be interested to know the treatment given to pupae taken back to East Africa. They were transported by air, immediately on arrival they were put in an ordinary domestic refrigerator for just over five weeks and were then exposed to ordinary temperatures, say in the middle eighties.

Notes and Observations

CELERIO GALII ROTT. IN SUFFOLK.—I had the opportunity of running a m.v. moth trap in Walberswick, Suffolk, on eight occasions between 2nd to 14th August 1959. The trap was set up in a garden in a fairly open situation, approximately half a mile from the sea and rather less than this from Walberswick Marshes and Walberswick Common. At least 500 moths (excluding micros) were caught on several nights and 155 different species were identified; approximately 90 species were caught on the first night alone. The most notable captures were a rather worn female *Celerio galii* Rott. on the night of 5-6th August, and single specimens of *Hydraecia petasitis* Doubl., *Parascotia fuliginaria* Linn. and the green var. *prasinaria* Hübn. of *Ellopia fasciaria* Linn.—J. V. DACIE, 10 Alan Road, Wimbledon, London, S.W.19.

IS HYLOICUS PINASTRI L. A DOUBLE-BROODED INSECT?—My friend, Mr. James Robertson Justice, the Naturalist film actor, telephoned me late the other night to tell me to his amazement that his brood of *Hyloicus pinastri* L. pupae were all starting to emerge. Having seen no reference in any books as to the species being double-brooded, he naturally assumed this to be a unique occasion. I was able to tell him, however, that during the war—when my father was living with me, after having been bombed out in Bexley—I had a small brood of this moth which had pupated rather incongruously in a coal bucket with a well-fitting lid. Owing to the pressure in the house, he was sleeping in the sitting-room, where I normally kept the bucket, when in the early hours of the morning he was disturbed by what he described as a frightful racket in one corner of the room. On investigation the following morning it was discovered that several of the Pine Hawks had emerged and had battered themselves almost unrecognisable in this small container. I never reported it to any Journal at the time, but now that J. R. J. has had the same experience, I feel this note may be of interest.—L. HUGH NEWMAN, F.R.E.S., "Betsoms", Westerham, Kent.

M.V. TRAPS.—I have read the article entitled "The use and abuse of the M.V. Trap" (*antea*, p. 179) by C.C. and I would be most interested to know how the writer boxes very large numbers of moths captured in his trap, and how long does it take him to deal with, say, 2,000 specimens? I use a small quantity of tetrachlorethane (as do many other users of traps) but even so, many moths like *Plusia gamma* L. and *Triphaena pronuba* fly out when the trap is opened. I do not find that the chemical, used in small doses, has any ill effects as the moths soon revive in the fresh air and I have bred many series from females taken in this way.

I find that without the use of a chemical in spite of egg boxes and other cover, when large numbers of moths are trapped, many are completely ruined, whereas with the use of the chemical, they quickly settle down. I have been using m.v. traps since 1950, and 9,000 came into my trap in one night, and in July 1956, over 10,000 were trapped in four nights.—R. GEOFFREY TODD, West Runton, Cromer, Norfolk. 8.ix.1959.

THE USE AND MISUSE OF M.V. TRAPS.—It is easy to allow feelings to run high on the question of the use to which moth traps are put. If, as is so often stressed, their chief purpose is to record the species occurring in a particular neighbourhood, with dates of first appearance and other notes of interest, then obviously the use of a lethal chemical is not only unnecessary, but is to be deplored on every conceivable ground. On the other hand there always will be some, mainly professional entomologists, who are conducting lengthy experiments which could not be concluded at all without killing the entire catch of insects each night. These are very much the minority, and most, like myself, want to use our traps in such a way as to harm the insect population to the least possible degree. Many of us have not sufficient time to box the entire night's catch, and then release it half a mile away, and though we do not throw our catch to the birds with relish and amusement, we have to deposit the insects in and around bushes and trees where a fair number will fall victims to birds before they can hide themselves. But after all, the birds must have their food, and many of the insects would become food for birds in any case. Insects of special interest I always deposit with special care in places away from the main catch, where I hope they will not be found, but that the birds should eat a good meal of *T. pronuba* and *A. monoglypha* might do more good than harm! In any case, a normally operated trap only catches a minute proportion of the total moth population of a locality. And if it be objected that moths released close to the trap will only enter it again the next night, it is always possible to operate the trap only on alternate nights, as I myself endeavour to do except in weather either too bad for this frequency of operation or so good that one's normal practice must be held in abeyance for a limited period, and even then, one can switch the light on after dark instead of at dusk, when the previous night's catch will have taken to the wing, and if this method be stigmatized as unscientific, it can be replied that most of us are not attempting a scientific experiment, but that nevertheless our work does increase scientific knowledge. Common sense and a sense of proportion will save us from abusing what is after all a side line or hobby, and not our main life work.—Rev. J. H. VINE HALL, Hutton Roof Vicarage, Westmorland. 10.ix.1959.

THE BRITISH RACES OF *ARICIA AGESTIS* SCHIFF.—It is always gratifying when a theory which one has developed as a result of observations in the field is confirmed by carefully controlled experiments. Accordingly, I am following with greatest interest the series of papers on *A. agestis* appearing in the *Record*, for they are going a long way towards confirming a theory which I tentatively put forward in a paper which appeared in the *Entomologist's Gazette* (1954: 5: 3-8). The more I see of the northern race (and I examine many specimens from the colonies around the head of Morecambe Bay each year) the more I am convinced that this race is far more distinct from the Southern *agestis* than it is from the Scottish *artaxerxes*, and that to describe it, as Dr. E. B. Ford does (*Butterflies*, 1945) as a hybrid population between the two is completely inaccurate. I pointed out the strict univoltinism as observed in the field, and also the similarities in the imaginal characteristics as evidence that *artaxerxes* and the northern English race are two parts of

what was originally the same population, isolated from each other for a considerable period by adverse climatic conditions, more severe in the case of the ancestors of the *artaxerxes* race than the northern English race, and meeting again in the comparatively recent past along the Durham coast. I do not myself believe that the southern *agestis*, which presumably reached this country between the onset of the late Glacial period and the breaking of the land bridge between the continent and our south coast, ever reached further north than the Midlands and Wales, where it met with isolated colonies of the much older northern race producing a population which in north Wales is partially double-brooded, and as it now appears, a population which has a small proportion of univoltines even as far south as Royston. If the experiments now being conducted can establish beyond doubt that the northern English race is thus distinct, and as worthy of sub-specific status as *artaxerxes* then they will be confirming what has for me become a strong conviction as a result of observing the insects in the field.—
Rev. J. H. VINE HALL, Hutton Roof Vicarage, Westmorland. 10.ix.1959.

EUBLEMMA PARVA HUB. IN SURREY.—On the night of 20th July last I took a specimen of *Eublemma parva* Hub. at light in my garden at Witley. This unexpected visitor was followed by two further specimens of the same species on the night of 24th July. As I have not heard of any other captures of *E. parva* elsewhere about this time it looks as though these insects bred on the spot and were the descendants of an earlier immigrant. I failed, unfortunately, to obtain any ova.—
J. L. MESSENGER, Stonehaven, Wormley Hill, Godalming. 5.ix.1959.

PAMMENE AURANTIANA STAUD.: A FURTHER NOTE.—With regard to the note on p. 222 of the September issue of the *Record*, it may be of interest to record that on 5th September several lots of seeds were collected by us from the tree stated to have been Norwegian maple, the identity of which has now been determined as none other than the common sycamore (*Acer pseudoplatanus*). Many of these seeds were tenanted by a larva, but no difference between it and that of *Pammene regiana* Zell. has been noticed, and it may be mentioned that a specimen of *regiana* was taken at the same time as the *aurantiana* on 26th July. It is of course possible that the larva of *aurantiana*, which has never been described, and is apparently unknown, is very similar to that of *regiana*.—S. WAKELY and J. M. CHALMERS-HUNT. 6.x.1959.

It is with very deep regret that we have heard of the death of Dr. Roger Verity last May, and we give below an account of a visit paid by Mr. and Mrs. E. P. Wiltshire to this Grand Old Man of entomology, which we had been asked to withhold until after his death. Dr. Verity's achievements will be recorded formally in other places, but this account seems to give a personal side which may not appear in other obituaries.—ED.

A Visit to Dr. R. Verity at Caldine in October 1953

By E. P. WILTSHIRE, F.R.E.S.

On arriving with my wife by car in Florence in October 1953, I found Dr. Verity's number in the telephone directory and rang him up. He at once invited us to tea that same evening. As we drove out from the city towards Caldine, the sun was setting and rain beginning to fall. Very soon the hills closed in about us, but Dr. Verity's verbal directions enabled me to find the turning under the railway line, leading to his villa. Unfortunately, I thought he had said his house was the fourth villa when in fact he had said first villa. It was now pouring with rain and nearly dark. The narrow mountain road passed one fine spacious villa, and then turned to the left up the terraced and cultivated mountain side. A few yards on it forked, and I took the upper fork but the nature of the road immediately gave me misgivings. I began to suspect I should at least have enquired for the doctor at the first villa. I backed cautiously towards the fork but the surface was too slippery and the turn too sharp for the car on such a narrow track. The left back wheel, when the car stopped with a crashing sound, was over the edge of the road, in the top of a hawthorn hedge, the other side of which, below the wheel, was a drop of six feet or more. We were stuck, for of course the car, of its own power (some 30 H.P.) could not go forward at all. The brakes and hedge prevented it going backwards any further.

I walked back to the villa, a matter of twenty yards, and asked whether Dr. Verity lived there. The domestics replied "yes" and that we were awaited, so we entered a picturesque rambling building, not seen to its best advantage on this stormy evening, passed to judge from the pervading aroma, a wine-press, and eventually, shedding our dripping coats and hats, reached the Doctor's room. Although he asked us to have tea right away, I related the misfortunes of the car and requested aid first. A male domestic or head farmer was at once summoned; he surveyed the situation and then brought a farm tractor to tow the car out of its predicament. It quite failed to do this so recourse was had to two fine white oxen, yoked together (that noble spectacle so typical of the Italian country side). They were hitched to the front of the car while I sat at the wheel. Once they fell to their knees in the slippery mud, but at last, with a lurch and a crash, the car went forward and the back wheel returned to the road. I then backed the car into the villa yard without misadventure and re-entered the house much admiring the superiority of animals over machines.

My wife and I sat down to an English tea in a little dark room lit by a lamp carried in for the purpose. The room was crammed with artistic treasures and bric-a-brac. Adjoining it was a larger drawing room, rather cold and gloomy, full of wonderful paintings and rare books.

Our host was a grey-haired, bearded, lively personality, though physically no longer active as formerly, and he spoke English perfectly. We understood that his father had been English and had settled permanently in Italy. From him the collection of orientalia and Italian paintings was derived. Our host had been educated as a doctor in Italy

and he had married an Italian wife; he was now a widower, waited on by a devoted couple and perhaps other unseen domestics.

After tea he took me into his study where he was revising finally the proofs of the fifth volume of his great work, "*La Farfalle diurne d'Italia*". Some of the plates lay on the table and I noted that the quality of their colour reproduction seemed even better, if that were possible, than that of the first four volumes. He said he had feared at one time that he might never complete it, but now the end was in sight (within a year I received my copy of this last volume, its higher cost reflecting how printing costs all over the world were mounting). We then looked at his wonderful collection in the next room. There was not time to see more than a few special parts of it, but I noted that he was very familiar with the critical points involved in whatever group I asked to see, and that his views were firm and readily evoked, and very sound. We did not discuss his great "exerge" theory, of course, and perhaps I shall deal with this in a later article.

All too soon it was time to return to our hotel in Florence and, unfortunately, there was no time to make another visit, but we left with a feeling of gratitude for his hospitality and the revealing glimpse of Italian country life, with admiration for his industry and intelligence, and also, though we felt saddened by the spectacle of a childless widower's lonely life amid his father's treasures and his own life work and collections, we were glad that he could still rely, in his declining years, on the service of old family retainers and the close companionship of nature's eternal pageant, so dear to all such as Roger Verity.



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THE ENTOMOLOGIST'S RECORD

AND JOURNAL OF VARIATION

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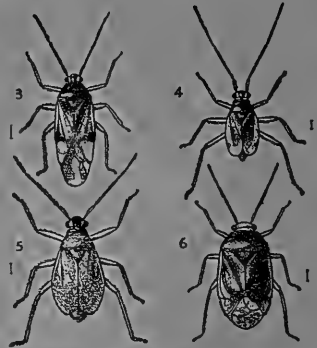
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Notes from Wessex

By H. SYMES.

For the first time for several years we have had some real summer weather without having to wait until after Mid-summer Day, and most things were two or three weeks earlier than last year. Day temperatures were often high, but there were some cold nights, and some species were kept back by this. Apart from a short and discouraging visit to Hod Hill on 13th May (*Ent. Rec.*, 71: 162) my first real outing was on 21st May, when I met Brig. Warry and Miss Pengilly and went with them to the woods in south Wiltshire. As on previous occasions, the main objective was the larva of *Apatura iris* L. In the first wood we visited, I found that the sallow bushes on which a larva had been found in 1956 and 1957 had been cleared away and a drainage trench had been driven along the side of the path. Elsewhere, a bush on which I found a larva in 1956 had been destroyed and its site marked by a heap of ashes. This was disheartening, and we must have searched scores of salallows before Brig. Warry beat an *iris* larva towards the end of the afternoon. We had a fairly good mixed bag of other larvae, certainly better than on the corresponding occasion last year, and it included 2 *Trichiura crataegi* L., 3 *Pseudoips bicolorana* Fuessly, 1 *Asphalia diluta* Schiff., 1 *Episema caeruleocephala* L., 6 *Brachyonychia sphinx* Hufn. and about a dozen *Orthosia miniosa* Schiff., close to the web in which they had spent their early stages.

On 26th May we met again in the neighbourhood of Glanville's Wootton, famous for its associations with J. C. and C. W. Dale. Here we found *Euphydryas aurinia* Rott. and *Argynnis euphrosyne* L. in large numbers, and Brig. Warry took a nice var. of each. *A. selene* Schiff. was also present. In a restricted area there was a small colony of *Hamearis lucina* L., and I found a few eggs on the underside of cowslip leaves. Beating for larvae yielded nothing of interest. Our third expedition was to Tarrant Gunville on 9th June, where our arrival was greeted by a heavy downpour of rain, which delayed operations. We proceeded to a locality where *Procris statice* had recently been taken, but the most likely place had been grazed bare by cattle. In some rough grass I found a female *Deilephila elpenor* L. close to the ground and, I think, newly emerged. We saw a good many *A. selene* Schiff. in fine condition, and a few *Callophrys rubi* L., mostly rather worn. Oaks and blackthorn were beaten, but the results were very disappointing. The only interesting larva that fell into my tray was a *Drymonia ruficornis* Hufn. A few years ago larvae of *Thecla quercus* L. were plentiful in this locality, but this time there were none and we had not seen any on 21st and 26th May when we were beating; presumably it was a poor year for this species.

On 16th June we met at Heytesbury to look for *Procris globulariae* Hb. on the Wiltshire downs. Leaving Bournemouth early, I reached Codford in time to call on Capt. R. A. Jackson and spend nearly an hour with him before proceeding to our rendezvous. He showed me his latest captures, including a wonderful variety of *Erynnis tages* L., which I have always regarded as rather a dull species. Captain

Jackson told me he had seen two *globulariae* on 29th May but very few since then. We had lovely weather for our search but found only five males and no females. *P. geryon* Hb. was more numerous and we took six males and five females. I had expected to see plenty of *Lysandra bellargus* Rott., but did not notice a single male myself, although Miss Pengilly took one, and when I returned home I found that, of two dark females that I had taken under the impression that they were *Polyommatus icarus* Rott. one turned out to be *bellargus*.

On 23rd June my wife and I went to Upwey to spend three days as the guests of Brig. and Mrs. Warry. We met in the morning at Bere Wood. Rain overnight—the first for over a fortnight—had saturated the undergrowth and made larva beating almost impossible. My only finds were one *Cybosia mesomella* L. and a larva of *Notodonta ziczac* L. We soon moved off to the open heath at Morden, where conditions were much more pleasant. Here we found *Diacrisia sannio* L. in fair numbers. They seemed to be especially associated with the neighbourhood of scattered young pine trees. Among those taken were three females, each of which laid a batch of eggs in its pillbox during the afternoon. Of butterflies *Plebejus argus* L., *Coenonympha pamphilus* L. and *Ochlodes venata* Br. & G. were plentiful. That night was the best of the year, so far, at Brig. Warry's m.v. light. At 8 o'clock a dense white fog shrouded everything, and the outlook appeared most unpromising, but fortunately the fog lifted about an hour later and at ten o'clock conditions were very good. Forty-eight species came to light, including a very fine *Stauropus fagi* L. and a *Harpyia hermelina* Goeze., both the first that Brig. Warry had recorded at Upwey—*D. elpenor* and *D. porcellus* L. (one), *Gastropacha quercifolia* L., *Philudoria potatoria* L., *Habrosyne pyritoides* Hufn., *Craniophora ligustri* Schiff., *Agrotis lunigera* Steph., *Plusia iota* L., *P. pulchrina* Haw. and *Polychrisia moneta* Fab.

On the evening of 24th June we went to look for *Arenostola morrisii* Dale (*Tapinostola bondii* Knaggs) in the south Dorset locality where it was discovered—or rather rediscovered—by the Rev. G. A. Ford last year (*Ent. Rec.*, 70: 296). My previous acquaintance with this species was confined to wonderful stories of the late Preb. A. P. Wickham chasing *bondii* down one of the streets of Folkestone, to the great entertainment of the local inhabitants, Wickham himself being completely impervious to the excitement he was causing. In those distant days, the Somerset entomologists whom I knew did not work for the species in the Dorset locality, but journeyed all the way to Folkestone, and it is not included in W. Parkinson Curtis's Dorset List, published in 1934. Having made our way to the right place and found the foodplant *Festuca arundinacea*; we spent an hour or two before dusk exploring the ground and, after a long search, I found a small moth resting underside uppermost on a horizontal stem of grass. This I boxed, and although it was very much smaller than we had expected, we decided that it must be *bondii*. Some time later, I found another in a similar position, but it dropped into the thick grass when I was trying to box it, and no amount of searching was of any avail. This "one that got away" was even smaller than the first one, differing in this respect from many a lost fish. As dusk fell, I saw a small white moth in flight, and was able to mark the spot where it settled and net

it. We had been led to expect a general flight between 9.30 and 10 p.m. B.S.T., but in actual fact, no such flight took place. I was pleased, however, to take a *Pyrrhia umbra* Hufn. flying around rest-harrow (*Ononis repens*). It was some time between 10 and 11 p.m. that we took two *bondii* hovering over their foodplant and I saw one or two others. There did not seem to be enough *F. arundinacea* to support any considerable number of *bondii* in this locality, but from the fact that three of the four specimens taken were not in very good condition, it would seem probable that, in this early season, they were nearly over. Incidentally, "Newman & Leeds" gives marram (*Ammophila arenaria*) as the foodplant, possibly through a botanical error. Scorer gives *Arrhenatherum avenaceum* (false oat) as well as *F. arundinacea*. Tutt (*Practical Hints*, I, 48) gives *A. avenaceum* only.

Next day we spent the afternoon at Durdle Door, where there was a profusion of *Zygaena filipendulae* L. and *Z. trifolii* Esp. including confluent forms of both species. We saw one or two *Argynnis aglaia* L. (*Mesoacidalia charlotta* Haw.), *Melanargia galatea* L. and *Aglais urticae* L., all three just beginning to emerge. In the evening, I accompanied Brig. Warry to Lodmoor, near Weymouth, where we had taken *Heliothis peltigera* Schiff. last year. It was an even better night than the 23rd, and sixty-two species were noted, many of them being the same as on that night. New arrivals included *Laothoe populi* L., *Smerinthus ocellatus* L., *Thyatria batis* L., *Arctia caja* L., *Hadena thalassina* Hufn., *Cucullia umbratica* L., and *Plusia festucae* L. (one). *D. porcellus* was absent, but *D. elpenor* arrived in large numbers, and there were ten on the sheet at the same time (all males). Next morning we returned to Bournemouth after a most enjoyable and profitable time.

On 7th July we paid a visit to Morden Heath, where our total catch—for three nets—was five *Coscinia cribraria* L. and four *Heliothis maritima* Grasl. One of the former was a female, and clung so tightly to its heather stem that I had great difficulty in boxing it. On the way home, it laid a small batch of eggs, of a beautiful golden colour, which changed on 10th July to silvery bronze, and hatched on the 18th. On 16th July I went to Ham Street for a few days with the Rev. F. M. B. Carr. My chief objective was *Thymelicus lineola* Ochs., the only native British butterfly that I had not taken. It occurs locally in some of the Ham Street woods, but it is not plentiful, and I had to work hard to obtain a score in four days. It was flying promiscuously with *T. sylvestris* Poda, and to me was quite indistinguishable from it on the wing. One simply had to net every skipper one saw, and examine it, and *sylvestris* outnumbered *lineola* by at least five or six to one. In a wood where *sylvestris* was very plentiful, I caught and examined a number without finding a single *lineola*. The woods were suffering from the drought and there were very few insects about. *Maniola tithonus* L. was the commonest butterfly. Of larvae, only two *Clostera pigra* Hufn. were found. Dungeness was even more scorched up, and *Linaria vulgaris* was scarcely visible. We ran across Mr. C. A. W. Duffield, sweeping for Homoptera, and he told us that he had found a lovely specimen of *Thalera fimbrialis* Scop. in his net that morning and had released it. While talking to him I noticed several specimens of the magnificent dragon-fly, *Anax imperator* Leach. On 21st July, Mr. Percy Cue took us to Camber in the evening to look for *Arenostola elymi*

Treits. We did not see any but took a few *Leucania litoralis* Curt. The sea buckthorn (*Hippophae rhamnoides*) was smothered with female *Euproctis chrysorrhoea* L. laying their eggs. After dark, a few males came to light. During the drive back, we came across a swarm of white-looking moths fluttering round a hedge: they did not seem to be attracted by our headlights. They turned out to be *Abrazas grossulariata* L. Further along the road, we ran into another swarm. Next morning we left Ham Street and stopped by the roadside between Petersfield and Winchester to look for larvae of *Cucullia lychnitis* Ramb. We found four—nearly full-grown—they all went down two days later—and about a dozen small ones. When I have found large and small larvae on the same day in previous years, I have noticed a tendency for the small ones to die, and such was the case this year, for although six reached their last instar, only one completed its growth and went down.

Back in Bournemouth I noticed an absence of butterflies (except whites) from my *Buddleia*. There had been a *Polygonia c-album* L. visiting it on 12th July, and one *Nymphalis io* L. appeared on the 23rd and once or twice in the next few days. A *Vanessa atalanta* L. and an *Aglais urticae* L. were seen on 4th August, but I did not notice either again for more than ten days, and *atalanta's* next appearance was on the 24th, while *c-album* turned up again on 5th September.

On 29th July I paid a visit with Mr. Carr to a Dorset locality for *C. lychnitis*, hoping to pick up a few more larvae. The foodplant *Verbascum nigrum* grows on banks along the roadside, but much of it had already been cut by the scythe brigade; what was left standing suggested that there had been a few larvae there, but they had either gone down or been taken by someone else.

On 5th August I went to Camp Hill, a well-known locality for *Lysandra coridon* Poda near Salisbury, and found that it was utterly ruined by a dense growth of tall, dry grass, due, I was told, to the disappearance of the rabbit from our countryside. A few *coridon* were flying in a very limited open area. I had arranged to go to Winspit with Mr. Carr on 12th August, but it was a wet day and we could not go until the 19th. By then *coridon* was well past its best, and though they were still on the wing and many of the females were in good condition, the males were nearly all very worn. But *L. bellargus* was just emerging and was beautifully fresh; so was *Polyommatus icarus*. I noticed a few *Aricia agestis* Schiff., and though I was still suffering from a surfeit of skippers after my activities at Ham Street and was not looking for *Thymelicus actaeon* Rott., I could not help noticing a few. At this time of year one generally sees *Colias croceus* Fourcr. and *Vanessa cardui* L. at Winspit, but both were absent, and the only Vanessid we saw was *A. urticae*.

On 25th August I paid—not very hopefully—my second visit of the year to Hod Hill, and found conditions there somewhat better than on the previous one—they could scarcely have been worse. Much of the area that had been grazed by cattle had made a fairly good recovery. But in one place, there used to be a magnificent mass of devil's bit scabious that must surely live in the memory of all who visited Hod Hill at this time of year. This has been stamped out of existence by the cattle, who reduced the area to a bare patch of

earth that became a sea of mud in wet weather. Now the ground is covered with a profusion of *Polygonum aviculare*, which is said to be a useful foodplant for many larvae in captivity, but has no attraction for butterflies, and aesthetically is a very poor substitute for *Scabiosa succisa* in bloom. Apart from this, there were a good number of late summer flowers, such as scabious, knapweed and thistles, and several species of yellow-flowered *Compositae*, but their growth was, not unnaturally, somewhat stunted. In the limited sector of the hill that had been inaccessible to the cattle, the rabbitless ramparts were overgrown with rank grass almost as badly as at Camp Hill. I was glad to find plenty of *L. bellargus* in perfect condition; this species seems to be holding its own at Hod Hill. I saw two *L. coridon*, several *P. icarus*, and some *A. agestis*, this last being less abundant than usual—not surprising after what had happened to its foodplant. The only Vanëssids in evidence were a few *A. urticae*; of the Satyrids, there were *Maniola jurtina* L., *Pararge megaera* L., *Coenonympha pamphilus* L., and near the trees at the foot of the hill, *Pararge egeria* L.

My next outing was on 28th August, when I drove with the Rev. F. M. B. Carr to Whiteparish. We started by looking for larvae of *Cucullia asteris* Schiff., but they must all have gone down as we did not find any, although the golden rod (*Solidago virgaurea*), of which there was much less than formerly, owing to the planting of Christmas trees, had been extensively eaten. I continued searching for larvae and found a *Clostera curtula* L., a *Ceramica pisi* L., and a *Calocalpe undulata* L. It was only the second larva of this species that I have found, and it was in exactly the same sort of position as the first, on a ground shoot of willow, about three feet high. In each case the larva had made a succession of hides of leaves spun together with a loose net-like web, and on both occasions I examined two or three empty hides before finding the larva: this time it was in the third hide, lower down the willow stem than the other two, and the larva was curled up inside, and looked like that of a Noctuid. Meantime, Mr. Carr had been using his beating tray, and beside a number of unidentified small Geometrids he got one *Harpyia furcula* Cl., three *Biston betularia* L. and three *Ectropis bistortata* Goeze. The only butterfly at all plentiful was *P. egeria*. Mr. Carr disturbed one *Gonepteryx rhamni* L. with his beating stick, and we caught a fleeting glimpse of one fulvous butterfly that might have been a belated *Argynnis paphia* L. or a Vanëssid, probably *c-album*.

On 1st September I met Brig. Warry and Miss Pengilly at Bloxworth for a day's larva beating in the woods. After a while I switched to searching and, as at Whiteparish, I found this more rewarding. Larvae were scarce, as in other localities this year, but an interesting mixed bag was obtained, including 1 *Laothoe populi* L., 1 *Harpyia furcula* Cl. not far from a hatched egg, and presumably second brood, 2 *Notodonta ziczac* L., 2 *Dasychira pudibunda* L., 2 *Drepana falcataria* L., 1 *D. lacertinaria* L. and 1 *Bena fagana* Fab. (only one!). Even more unproductive was a visit to the Glanville's Wootton locality on 10th September, where I did not find a single larva by searching. Brig. Warry and Miss Pengilly had little success with beating: they got 1 *B. fagana*, 1 *Phalera bucephala* L., 2 very large *Biston strataria* Hufn., several *Opisthograptis luteolata* L. and a number of unidentified small

Geometrids. There was a remarkable absence of butterflies: no *c-album* on the devils bit scabious usually so attractive to that species, no *V. atalanta* or *A. urticae*. The only butterflies seen in any number were *P. egeria* and *Lycaena phlaeas* L., the latter coming to the flowers of fleabane (*Pulicaria dysenterica*).

On 12th September, about half a dozen male *Orgyia antiqua* L. assembled round a small cage in which two *O. recens* Hb. had just emerged. They entered the shed in which the cage was kept, and when I moved it into the house, they came in through a first floor window. I netted four males and put them into the cage, where I saw one of them attempting to pair with a *recens*, but could not be sure whether the attempt succeeded. Eggs were laid and I hope they may be fertile. There was more assembling when two female *recens* emerged a few days later.

Although 1959 was the best summer for many years, it seems to have been a poor season for lepidoptera, and there has been a remarkable absence of migrants. I have not seen *C. croceus*, *V. cardui* or *Macroglossum stellatarum* L. The only immigrant that I found plentiful was *Nomophila noctuella* Schiff., which turned up everywhere, even in my garden in Bournemouth. I have seen fewer Vanessids than in any of the recent bad summers, and from what I have heard, this scarcity seems to have been general in the south of England, but Mr. E. W. Smith has informed me that *V. atalanta* and *A. urticae* have been abundant at Doncaster. One butterfly that I have found plentiful in all suitable localities is *P. egeria*, and Mr. A. C. R. Redgrave tells me that it was common in his garden at Gloucester. As this species is associated with shady and rather damp places, I think this is rather surprising in such a dry season.

From various sources I gather that moths have not been coming at all well to light or sugar, and at any rate since midsummer, I have never known a worse season for larvae. Perhaps we have been suffering from the cumulative effects of a succession of poor summers, but it certainly looks as if recovery will not be rapid.

Butterflies taken in the Valais District of Switzerland

By Lt. Col. HUGH BRIDGES

The following is an account of three trips to Champex in search of butterflies in August 1947, August 1948, and in June, July, August 1955. Champex Lac is situated in the Valais district of Switzerland at an altitude of 4823 feet, and is French-speaking. In addition to the butterflies, the surrounding hills are, in June and July, of great interest to the botanist. There is a fine lake where one may go boating and fishing, the fish being a species of trout, caught with worm as bait. During the season (25th July until the end of August) gymkhanas and various evening entertainments are held which help to enliven the proceedings. The weather is unpredictable; my experience in 1955 produced eight days' rain in June, fourteen days' rain

in July, and nine days' rain in August; the other days were fine and hot, with plenty of butterflies on the wing.

I would recommend June until 25th July, which is out of season and cheaper; also few people are there. Communications to the various collecting grounds are excellent; 'buses and the mountain railway will land you on whichever collecting ground you have chosen, in excellent time, and will bring you back in time for the evening meal or earlier—hotels are good, and, for Switzerland, reasonable; I can recommend the Hotel Glacier, where I stayed on all my trips. The journey to Champex takes less than twenty-four hours from London via Calais, where one can get a through coach to Martigny. At Martigny, a change is made to the mountain railway to Orsières, whence a 'bus takes one to Champex.

LIST OF COLLECTING GROUNDS

- (i) Val d'Arpettaz; about an hour's walk up the valley.
- (ii) The meadows below Hotel de Suisse on the Champex-Valette road.
- (iii) The mountain path Champex-Orsières.
- (iv) The main road Champex-Orsières and follow it on towards Martigny (June-July only, too much traffic in August).
- (v) The path to Tour de la Batiaz and its vicinity.
- (vi) Val Ferret (5,250 feet).
- (vii) The edge of the woods and meadows on the left of the road Martigny-Vernayaz.
- (viii) Trips to Chamonix and the Saint Bernard Pass, 8,111 feet, can be done in the day, where different species can be found.

LIST OF BUTTERFLIES SEEN AT CHAMPEX AND IN THE SURROUNDING COUNTRY IN THE THREE TRIPS

- Papilio machaon* L. This insect was seen from Martigny up to about 4,000 feet, on the second brood.
- P. podalirius* L. This handsome butterfly was usually seen on the path up to the Tour de la Batiaz, and in the vicinity of Martigny; June onwards.
- Parnassius apollo* L. Common on the Champex-Orsières road during the whole period on flowers of thistles.
- Aporia crataegi* L. Common everywhere, mid-June onwards.
- Pieris brassicae* L. Second brood in small numbers; Martigny.
- P. rapae* L. Common as high as Champex.
- P. manni* May. Quite common in August 1955 on the Tour de la Batiaz path, also in June 1955.
- P. napi* L. Found singly over the area.
- P. bryoniae* O. A few seen over the area.
- Pontia daplidice* L. Caught at Martigny, viii.1947.
- Euchloë simplonia* Frr. A pair taken at Champex, mid-June.
- E. cardamines* L. Taken in June over a wide area.
- Gonepteryx rhamni* L. Scarce in August, Martigny.
- Colias palaeno* ssp. *europomene* Esp. Caught at Vald'Arpettaz in July; very hard to catch.
- C. phicomone* Esp. Caught on the Valette road, end June, and Val d'Arpettaz in August.
- C. hyale* L. Flies very fast and seen singly over the area at any time.

- C. croceus* Fourc. Occurs some years, absent others.
f. *helice* Hbn. Captured singly on flowers over the period.
- Leptidia sinapis* L. The various broods were seen from 5,500 feet to the level of Martigny throughout the period.
- Erebia melampus* Fuessli. Common in July and August over 5,000 feet at Val d'Arpettaz and Val Ferret.
- E. mnestra* Hbn. Found Val d'Arpettaz, Val Ferret and Valette road in July and August.
- E. pharte* Hbn. A pair taken at 5,500 feet in July.
- E. ceto* Hbn. Common at Champex, mid-June.
- E. stygne* Och. Common below Champex, early July.
- E. montanus* de Prun. In fair numbers on the Valette road; August.
- E. aethiops* Esp. In early August over Champex; fairly common.
- E. euryale* Esp. Val d'Arpettaz in August.
- E. ligea* L. A common butterfly below Champex, beginning mid-July.
- E. tyndarus* Esp. Common at Val Ferret, 5,000 feet, in August.
- Melanargia galathea* L. Common everywhere below Champex after mid-July.
- Satyrus alcyone* Schiff. Martigny and Tour de la Batiaz path, end of July onwards.
- S. semele* L. Very fine specimens were obtained between 4,700 feet and 3,000 feet vicinity of Champex beginning July onwards.
- S. statilinus* var. *allionia* F. Common late in August on the Tour de la Batiaz path.
- S. cordula* F. Common below Champex, beginning July.
- S. dryas* Scop. Taken at Martigny, August 1947.
- Pararge aegeria* L. f. *egerides* Stgr. Found in small numbers in woods near Martigny, July.
- P. megera* L. Found in fair numbers at low elevation, August.
- P. hiera* F. In June at 4,000 feet; rather scarce.
- P. maera* L. Plentiful everywhere.
- Aphantopus hyperantus* L. Found from Orsières to Martigny from July.
- Epinephele jurtina* L. Common from end of June.
- E. lycaon* Rott. Local on Champex-Orsières road from end of July.
- Coenonympha iphis* Schiff. Found at Champex and Val d'Arpettaz, end of June onwards.
- C. pamphilus* L. Common at all times.
- Limnitis camilla* L. Seen at edge of woods, vicinity Martigny; June-July; rare.
- L. rivularis herculeana* Stich. Seen together with *L. camilla*, similar places and times; rare.
- Pyrameis atalanta* L. On thistles; August.
- P. cardui* L. Occurs in some years.
- Vanessa io* L. Thistles in August.
- V. urticae* L. At all times, usually on ground.
- V. polychloros* L. Seen in viii.1948 and viii.1955, Martigny.
- V. antiopa* L. Seen on flowers in alpine garden, Champex, ix.1954 (information reliable).
- Polygonia c-album* L. Captured on thistles from Champex to Martigny; not common.

- Melitaea cinxia* L. Only one specimen caught mid-June 1955. Not rare other years.
- M. phoebe* W.V. Caught at 4,000 feet beginning of August.
- M. didyma* Esp. A few seen about 4,000 feet, July and end July.
- M. diamina* Lang. A good series Martigny, June-July.
- Mellicta aurelia* Nick. One specimen, mid-August, 4,000 feet.
- M. athalia* Rott. The commonest *Mellicta* flying.
- M. deione berisalii* Ruhl. Taken end of June, 4,000 feet.
- M. parthenoides* Kef. One specimen taken end July at 4,000 feet.
- Clossiana euphrosyne* L. This butterfly flies in June and August, Val Ferret, Champex, Val d'Arpettaz.
- C. amathusia* Esp. Common at Champex and above; end of June onwards.
- C. dia* L. Flies everywhere, but absent some years.
- Boloria pales* Schiff. A few seen at 5,500 feet, Val Ferret, in August.
- Brenthis ino* Rott. Val Ferret, 4,500 feet in July.
- B. daphne* Schiff. Martigny in April.
- Issoria lathonia* L. Common everywhere.
- Mesoacidalia charlotta* Haw. In July, common.
- Fabriciana niobe* L. f. *eris* Meig. A common butterfly from July onwards.
- F. cydippe* L. Common from July onwards.
- Argynnis paphia* L. Vicinity of Martigny, July.
- Pandoriana maia* Cr. One worn specimen seen, Orsières, August 1947.
- Nemeobius lucina* L. A few specimens at Martigny and below Champex, 4,000 feet, in June.
- Callophrys rubi* L. Found locally over the area Val d'Arpettaz, June and later.
- Strymonidia spini* Schiff. Rare at Martigny and below Champex, 4,000 feet.
- Quercusia quercus* L. One ♀ seen at Martigny.
- Thecla betulae* L. Two females caught at Martigny, August 1955.
- Lycaena virgaureae* L. Common in July 1955. The females appear to fly after the males.
- L. hippothoe eurydame* Hoff. Orsières appears to be their locality, mid-June 1955.
- L. alciphron gordius* Sulz. Two captured, Martigny, end June 1955.
- L. phlaeas* L. Seen in small numbers at Martigny, 1947.
- L. doris* Hufn. Martigny in August 1947 and 1955.
- Cupido minimus* Fuessl. Everywhere.
- Plebejus argus* L. Caught Orsières, June and Val Ferret, August.
- Vacciniina optilete* Knoch. August locally in Val d'Arpettaz, first week.
- Scolitantides orion* Pall. One specimen caught, Martigny, mid-June.
- Aricia chiron* Rott. About 4,000 feet, common in June and July.
- A. donzelii* Bdv. Locally with *V. optilete* in Val d'Arpettaz.
- Polyommatus eros* Och. One caught Val Ferret, August 1955, 5,000 feet.
- P. icarus* Rott. Common.
- Lysandra argester* Berg. Caught Val Ferret and Orsières, June and July.
- L. bellargus* Rott. Common below Champex, 3,500 feet.
- L. coridon* Poda. Flies with *L. bellargus*.
- Meleageria meleager* Esp. Caught singly from 5,000 feet downwards.

- Agrodiaetus damon* Schiff. Flies with *coridon* and *bellargus*, emerging end of July.
- Cyaniris semiargus montana* Mey.-D. Common, the form *montana* is caught in Val Ferret.
- Maculinea arion* L. This insect is caught singly all over the area.
- Everes coretas* O. Martigny, August 1947.
- Celastrina argiolus* L. One worn specimen seen on Batiaz path, August 1955.
- Carcharodus floccifera* Zell. Val Ferret, July.
- C. alceae* Esp. Lac Champex, August 1947.
- Pyrgus fritillarius* Poda. 3,000/4,000 feet, July.
- P. carlinae* Rbr. Val Ferret, August.
- P. alveus* Hbn. Val Ferret, July, common.
- P. malvae* L. Common.
- P. armoricanus* Obth. Common.
- Erynnis tages* L. Common.
- Carterocephalus palaemon* Pall. Valette road in August.
- Thymelicus lineola* Och. Found at 3,500 feet on Orsières road.
- T. sylvestris* Poda. Found at same place.
- Ochlodes venata faunus* Tur. Everywhere.
- Hesperia comma* L. Scarce, Val Ferret, 4,000 feet.

Yugoslavia Revisited

By Major-General C. G. LIPSCOMB, D.S.O.

An account appeared in the September, 1958, number of *The Record* of an expedition I made to Yugoslavia in the early summer of that year. This year, in the latter part of August, I was fortunate enough to be able to spend a camping holiday in the Northern part of that country and my experiences have proved to be so interesting entomologically that I feel they justify me in writing another article.

Northern Germany, in common with the British Isles, has had a wonderful summer this year and it was, therefore, a disappointment when we reached Austria on August 15th to find that the weather was anything but summerlike, with the rivers in flood, the thermometer in the fifties and no sign of a break in the incessant downpour. Two days of this treatment was enough to drive us further South and on the 17th we reached Bled in Yugoslavia, where we pitched our tents that evening in the excellent camping site provided near the lake.

Our camp site was on the side of a valley in an area of open park land bounded by woods growing on the rocky limestone hillsides. Under the prevailing conditions of dampness we were glad to find that the majority of other campers had departed so that we had the place, more or less, to ourselves. The normal flowers one expects to see at this time of year were in evidence and, in addition, we were delighted to find that the wild cyclamen was well out under the trees round the border of the woods.

The weather was still far from settled but a spell of sunshine the following morning enabled me to get an impression of the butterfly population without going further than a few hundred yards from our tents. The second brood of that attractive little fritillary *Argynis dia*

L. was common and a single specimen of its larger cousin *Argynis titania* Hbn. was examined. Other Argynids on the wing in various stages of freshness were *charlotta*, *niobe*, *adippe*, including a fine ♀ f. *cleodoxa*, and *paphia*; a surprising collection for so late in the season. Second brood *Leptidea sinapis* L. was common and a few *Lysandra coridon* Poda had strayed from their more normal haunts to join the rest of the butterfly population. A single *Erebia ligea* L. was captured near the lake and a large black-looking butterfly proved to be *Minois dryas* Scop. The ♀♀, particularly of the latter, had very prominent blue eyespots and were probably referable to ssp. *drymeia*. The only Vanessid seen was a single *V. atalanta* L. and neither *Colius croceus* Fourcroy nor *Colias hyale* L. was particularly common; perhaps they too, like the other campers, had migrated to avoid the weather!

On August 19th we made an expedition to the source of the Sava, a wild gin-clear river, full of fat grayling, which flows close to Bled and eventually joins the Danube. Our road followed the river as far as the lake at Bohinjsko Jes, where it skirts the lake shore and finally rejoins the river when it enters the lake. Here we left our car and ate our lunch on the river bank before walking the last few miles to the source itself. In a nearby meadow, fresh specimens of the coppers *Heodes tityrus* Poda and *Palaeochrysophanus hippothoe* L. were seen—a late date for the latter unless they should have been members of a second brood which, I understand, is not normal with this species.

One of the advantages of butterfly hunting in Yugoslavia is that many very accessible collecting grounds remain untouched by man or beast throughout the year and are not, as is so often the case in other Alpine districts, scythed for hay several times in the season or overgrazed by cattle and other four-footed animals. It was, therefore, not altogether surprising to find the open ground flanking the path we followed after lunch an absolute mass of flowers and literally swarming with "blues"; *coridon*, still fresh, was there in number and many of the ♂♂ had very distinctive wide black borders to their forewings and appeared to be an extreme form of f. *marginata*. *Lysandra bellargus* Rott. was almost equally common as also was the second brood of *Plebejus argus* L. f. *cleomenes* Fruhst, the form of this butterfly in which the ♂♂ have wide black borders to their wings. Further on the path wound its way up the mountain-side through an ancient beech forest until eventually it reached a point from which we could see at close quarters the infant Sava gushing out of a crack in a vertical wall of rock before cascading downwards in a thundering waterfall. An appropriate beginning we all thought for such a noble river.

Back in Bled, preparations were afoot for the arrival of Haile Selassie to stay in the ex-Royal summer palace as Tito's guest. Ethiopian and Yugoslavian national flags were everywhere and the following morning I found myself, quite by accident, standing by the roadside as Tito and his royal guest drove past accompanied by their underlings and a police escort of outriders. I took off my hat and, for lack of a flag, waved my bug net. The Emperor lent forward in his seat and waved back, so all was well and the procession moved on.

Up to now it had rained heavily each night and part of each day and we decided that however attractive an area it might be for collecting, it had its disadvantages from the point of view of camping.

So on the 21st we packed up and set off south to find, we hoped, a blue sky and the sun in the Istrian peninsula. We lunched that day on the banks of the Uneca, an attractive trout stream which, in the way that Yugoslavian rivers have, emerges at the base of a hillside near the village of Planina as a fully-fledged river and disappears some miles further on in the middle of a hayfield.

The river was in flood and unfishable but on a nearby hillside I saw my first *Brintesia circe* F.W.W., a huge black and white butterfly, as it flew sedately over a clover field. A very fresh ♀ *Heodes virgaureae* L. captured on the same after-lunch stroll would seem to be another example of an unexpected second brood. *Coridon*, too, was everywhere; in fact, I had by now come to the conclusion that the whole of this part of Slovenia was one huge "Chalker" down.

Our route south took us through Opatija and then down the East side of the Istrian peninsula. Our hearts sank as we viewed with dismay the packed camp sites when we reached the coast but the sun at last was now shining from a cloudless sky and, after consulting our map, we decided to make for Rabac, a small coastal village on a byroad about two-thirds of the way down the peninsula. In the event it proved a happy decision as we could hardly have found a more delightful spot. The village itself consisted of a handful of houses clustering round a quay and a site for the camp was found in an olive grove, many acres in extent, bounded on one side by the seashore and to landwards by scrub covered hillsides. Once again we were lucky in having the place almost entirely to ourselves. The olive grove itself occupied a flat valley floor and was divided up into plots by thick bramble hedges and stone walls. Some of the ground had been cultivated but much of it was untouched and supported a mass of wild flowers.

Huge shiny black bumblebees, looking like animated dumbledor beetles, were busy gathering pollen and equally large hornets hawked the hedgerows and fields for their prey. Butterflies can best be described as being in bewildering profusion and in the six days we were there I recorded no less than 36 different species. *Hipparchia fagi* Scop, so similar to and equally as large as *circe*, which was also present, was particularly common and fond of sitting about on the trunks of the olive trees. The second brood of *Melitaea didyma* Esp. was well out and very much less heavily marked than the spring form. A butterfly identical in flight and habits to *fagi* but considerably smaller and not nearly so common, was identified as *Chazara briseis* L. Another of the same family *Hipparchia statilinus* Hufn. favoured the barren rocky ground near the seashore about a mile North of the village. It looked quite black on the wing and the eyespots on the upperside of the forewings were only just discernible. That lovely little butterfly *Limenitis amonyma* Lewis, so like a small edition of the White Admiral but with a blue black ground colour, favoured the hedgerows although it was not common. *Pararge aegeria* L. lurked in shady places but was distinctly rare. I gave this butterfly more than its fair share of attention as I was anxious to take ssp. *aegeria* L. but only found one specimen which approached this form; the rest were indistinguishable from those we are familiar with at home. Most unexpectedly *paphia* was particularly common with many fresh specimens of both sexes. It is

not supposed to be double brooded so it is hard to account for this late emergence. *Sinapis* was particularly numerous and all the ♀♀ I examined were ab. *erysimi* with the upper side of their forewings quite devoid of black markings. Apart from *hyale* and *croceus*, which were everywhere, migrants were not much in evidence and only four *Issoria lathonia* L. and about half a dozen *Pontia daplidice* L. were seen. *Bellargus* was very common and fresh but *coridon* appeared to be quite absent. Only one *Papilio machaon* L. was seen when I went to "clock in" as a visiting migrant at the local police station where it was feeding on valerian flowers growing outside the office window. The Autumn brood of *Polygonia egea* Cr. was not common but the few specimens seen appeared to be darker and more heavily marked than the Spring form I had first become acquainted with on my previous visit. They seemed to be fond of sitting about on walls with expanded wings. Only one *Lycaena phlaeas* L. was noted, a ♂ with very dark suffused forewings, probably the normal summer form in these parts.

On the 24th we made an expedition to Pula, a small port with a long history at the very tip of the peninsula. Several stops were made en route but nothing fresh was found although the country with its open oak scrub and rough fields looked promising. Pula itself is probably best known for its Roman remains, and of these the very well-preserved amphitheatre is the best known and most spectacular. We went to have a look at this ruin and outside the entrance gate I watched for some time a solitary *Papilio podalirius* L. as it sailed round and over some bushes. Inside on the short grass of the arena, where no doubt once Christians were thrown to the lions, I saw a single *daplidice* extracting what nourishment it could from the few flowers that were growing. Food in Yugoslavia is always a problem but on this occasion we decided to risk a lunch at what seemed to be one of the better-class restaurants. The waiter assured us that fish was the dish of the day so I gave the appropriate order and after a very long delay and the consumption on our part of much beer, our lunch was at last produced. An animal more nearly resembling a Coelocanth than anything else I have seen rested on the plate. It had a huge bony head, a tough and scaly hide and its flesh was as tasteless as wet cotton wool. Altogether our meal was not a success, but we had learnt our lesson and sandwiches in future were the rule!

Other interesting butterflies noted at Rabac before we left on the 27th were *Syntarucus piritous* L., *Polyommatus icarus* L., a large fine race, *Everes argiades* Pall, *Everes alcetas* Hfmsgg., *Carcharodus alceae* Esp., *Pyrgus cirsii* Rbv., a skipper very similar to *malvae*, *Dira maera* L., *Dira mequa* L. and a single *Pyronea tithonus* L. or possibly *Pyronea cecilia* Vall. as it flew over a hedge before I could net it to make certain of its identity. Whichever it was it must have been very near the Southern limit of its range.

Our way back took us through Postojna where we visited the famous limestone cave of which something like 21 kilometres have so far been explored. From any point of view it is well worth a visit and the conducted tours and interior lighting arrangements are very well done. This cave is the only known home of a certain type of salamander, which lives in the underground rivers. It is an unattractive-looking

beast, being some eight inches long with rudimentary limbs and is more like a cream-coloured worm than anything else. They have the remarkable ability of being either oviparous or viviparous according to the temperature of the water in which they live. That same night we repitched our tents at Bled; as we did so it started to rain and continued to do so all night and was still hard at it next morning.

We had intended staying a few days but we had had enough of this sort of treatment before and were soon on our way back to Austria. Here, although there were hardly any butterflies, we did at least have a week of uninterrupted sunshine in which to finish our holiday.

Cologne. 21.ix.1959.

Notes on the Microlepidoptera

By H. C. HUGGINS, F.R.E.S.

THE PRESENT DAY STATUS OF RARE PYRALID IMMIGRANTS.

Mr. P. E. S. Whalley's recent most interesting paper on the genus *Chrysocrambus* Blesz. (*Entomologist*, 92: 180/3) has now cleared up the position of the *craterellus* complex. From it I gather that the only two species of which alleged British specimens exist are *craterellus* Scop. and *cassentiniellus* H.S. I possess one of each, with, to my mind, not very convincing data, and when I examined all the specimens in the B.M. recently I did not think that their pedigrees were much better. There would appear to be no records of these insects in the present century, and until some turn up I am afraid I shall remain sceptical, as practically all the rare and doubtful ones of the group have turned up recently except *Psammotois pulveralis* Hubn. and *Pyrausta repandalis* Schiff., both of which have somewhat different histories from the other immigrants as they have been found in temporary colonies and not as odd specimens.

The two *Diasemias*, *litterata* Scop. and *ramburialis* Dup. have each appeared in a number of districts as stragglers, and *Antigastra catalaunalis* Dup. was taken last year at Dover by Mr. Youden. *Uresiphita gilvata* Fab. (*polygonalis* Hubn.) was taken just before the war in Kent and again two years ago at Bradwell-on-Sea by my friend Mr. A. J. Dewick. I am pleased to say that it has again been taken by a friend of mine this October, but I do not feel justified in giving further particulars until he has recorded it himself, and I am told that a second specimen was seen and missed in the same locality by another collector on the following evening.

Heterographis oblitella Zell. continues to occur as a very scarce arrival, and *Palpita unionalis* Hubn. has now reached the point at which it is only considered as one of scarcer immigrants, like *Nycterosea obstipata* Fabr.

There are two Crambids, certainly, that have not been recorded since the '80s, *C. lithargyrellus* Hubn. and *C. poliellus* Treits., but I regard both of these as moths that are very easily overlooked. Mr. Whalley recently showed me Tutt's specimens of each from Deal, Kent; 4 *lithargyrellus* and 1 *poliellus*: *lithargyrellus* is superficially like *C. perlellus* Scop. except that it has a distinctly brassy sheen as opposed to the silvery one of the common insect, and *poliellus*, whilst larger and

more narrow winged, could easily be mistaken for a slightly faded specimen of the pale dark costaed form of *U. culmellus* Linn. Both *perlellus* and *culmellus* vary very greatly, and no one wants them, so the rarer moths could easily be passed over.

Mr. Whalley and I discussed the possibility of accidental substitution in the case of the Tutt insects, but considered it unlikely as at the early date when they were taken, Tutt had not begun working extensively abroad.

This danger of accidental substitution is only too easy: in 1929 W. Fassnidge showed me a moth we could not identify which he told me he had bred from a wood near Southhampton. Two years later, however, when I asked him if he had bred any more, he showed me several others he had now bred from the south of France, and told me he was quite satisfied that the pupa of the first specimen had been mixed with some English material.

The "Galashiels" *Erebia ligea* is regarded at Tring as an error in labelling, Dr. Cockayne told me.

Until we get further examples, I am afraid I shall regard the "British" Chrysocrambids as originating in accidental importation and supplemented by fraud.

Collecting Notes

A correspondent writing of a sugaring expedition he had recently made remarked: "For the first time, on this two days' trip, I used Newman's relaxing-tins. Excellent as these are in many respects, I would offer a word of warning as to insects taken at treacle. Perhaps I left them too long, or packed too tightly, but, when emptied out seven days later, a fair number of Noctuids were soaked through in exuded treacle and hopelessly spoiled. All other captures were in fine order, so in future I shall endeavour to set all my treacle captures and only pack others".

This matter of how best to deal with moths taken at sugar is one that must have exercised sugarers since the time of Doubleday. To knock the moths off the sugar straight into a killing-bottle or to kill them as soon as one reaches home is to ensure that the bodies of some of them (those that have had the longest tuck-in at the treacle) will be full of sugar which will ooze out and finally destroy them as cabinet specimens. To leave them in the boxes all night so that they can void the sugar results in some, probably most, of the moths battering themselves to ruin at dawn.

We ourselves solved this problem long ago by adopting the following expedient. The moths were boxed off the sugar into willow-chip boxes. On reaching home we took a reel of white tape, one-quarter of an inch wide, and cut it into as many snippets, about five-eighths or three-quarters of an inch long, as we had boxes. The boxes were then put in single file on some bookshelves (on no account must they be heaped together) and the lid of each box was raised at one side as though to admit air. Since our sugar always contained a good deal of rum, the moths, being unaccustomed to alcoholic beverages, were fuddled and sat quietly on the bottom of the boxes. We then poured

into a small pot half an inch of mixed chloroform and surgical spirit, 50/50. Taking up the snippets of tape with a forceps each one was dipped into the spirit, one was pushed into each box, and the lids were closed, the tape being pinched between box and lid. The moths remained lightly anaesthetized until the sun was well up, and after breakfast they were put into the k.b., and finally set. Metabolism went on while they were under the influence, and perfect cabinet specimens were obtained.

It is unwise to use neat chloroform for anaesthetizing moths or butterflies. If used, the insects flutter wildly for a moment or two and damage their fringes. It is for this reason that we have never taken to ammonia; for not only does ammonia destroy the delicate colours of some insects' wings (those with green in them, such as the Emeralds, and with pink in them, such as the Elephant hawkmoths and Peach-blossom, and with yellow in them, such as the Yellow Ermine, which it turns to ochre) but the effect of ammonia on a lepidopteron is akin to strangulation on a human. No wonder there is violent struggling for a moment or two. But if chloroform be mixed with an equal volume of surgical spirit the insect, so to speak, never knows anything about it. It does not bat an eyelid, and all at once it rolls quietly on to its side, unconscious. When unconsciousness supervenes the insect should always be removed from the vapour and killed in some other way: to use chloroform as a killing agent is unwise, since it causes a rigor of the wing muscles which does not pass off and is exceedingly difficult to overcome. Cyanide also has its disadvantages as a killing agent, destroying the bright yellow of many species. In a damp atmosphere it can even turn yellow fringes into pink ones.

Notes and Observations

LIMACODES TESTUDO SCHIFF. IN SURREY.—In reply to the query of your correspondent, Mr. E. E. Johnson, regarding the festoon moth, *Limacodes testudo* Schiff., I am able to confirm that this is a Surrey insect. I lived for many years about half way up the hill between Compton and the top of the Hog's Back, and here, usually during the month of June, *testudo* was a not infrequent visitor to light. I see, for instance, from my notes that on the 14th June 1934 fourteen males came to the sheet. The only female I ever saw was bred from a larva found feeding on beech, which is abundant in the neighbourhood. The locality is about a mile from Puttenham Common, where Mr. Johnson took his specimen.—E. S. A. BAYNES, 2 Arkendale Road, Glenageary, Co. Dublin.

AN ALBINO PARARGE MEGERA L.—I should like to record my capture on 15th August on Puttenham Common, Surrey, of an albino male *Pararge megera* L. It looked very striking on the wing as it went quickly by me and as quickly turned back; it appeared to be something exotic. For the moment I was completely puzzled, but with the insect safely in my net, the question of identity was answered at a glance.—E. E. JOHNSON, Highfield House, Portsmouth Road, Guildford. 19.ix.1959.

TELPHUSA TRIPARELLA ZELL. AT ESHER.—Mr. S. Wakely's recent note on this species (antea: 154) shows that it is actually, in the present century at least, quite a scarce insect and much more local than our standard works indicate. Most writers of such works tend to rely heavily in these matters upon statements of earlier authorities, when they exist, and in this case Mr. Wakely has pointed out that confusion with another species may have been involved. I, personally, am far more impressed by the fact that Mr. Wakely, with his very wide contemporary experience of the "micros", has himself only once found the species, and then only a solitary specimen!

That being so, it is worth while to record my capture of a single example of *T. triparella* flying at dusk on Esher Common, Surrey, on 31st May 1957. The moth was netted over the open heath near the Black Pond; the nearest oaks, from which it had presumably come, are in wooded areas perhaps a few hundred yards distant. On the other hand there is just a possibility that bog myrtle (now known as an alternative food-plant) may grow concealed among the dense birch scrub fringing the boggy edge of the pond—considerably closer to where the moth occurred than the nearest oaks. I have never seen the plant there, but the situation appears to be quite suitable for it.—A. A. ALLEN, 63 Blackheath Park, London, S.E.3. 14.x.1959.

TWO VERY LOCAL MICROS IN N.W. KENT.—At the end of June 1958, on the occasion of the South London Entomological and Natural History Society's excursion to Halling Downs, Kent—a locality rich in microlepidoptera, producing freely such interesting species as *Nephopteryx obductella* F.R. and *Depressaria nanatella* Stnt.—I gathered a rolled leaf of black knapweed (*Centaurea nigra*) containing a smallish larva. It fed up readily on this plant, which, conveniently, had just made its appearance in my garden. Its general appearance suggested a *Depressaria* and the very characteristic colouring—greenish in front, becoming blackish behind, left little doubt, from Meyrick's description, that the species was, in fact, *D. pallorella* Zell.; a surmise proved correct by the emergence of the moth on 8th August.

In the same spot on the downs, whilst collecting examples of the Mirid bug *Tinicephalus hortulanus* Mey.-D. from rockrose (*Helianthemum chamaecistus*), I found two good sized larval cases amongst a clump of that plant. The larvae fed but little in captivity and failed to produce moths, or indeed, even parasites. Identification, however, was easy; the distinctly two-coloured cases, in conjunction with the food plant, showed that they could only be *Coleophora ochrea* Haw.—as Mr S. Wakely has since confirmed.

Mr. Wakely tells me that both species of moth are very local and that he does not know of a definite record of either for this part of the country, at all events, a modern one, so that their occurrence at Halling is of some interest. He has met with them only further west, both in numbers in their restricted localities: *D. pallorella* in the Lewes and Studland districts—it is generally coastal—and *C. ochrea* in the Isle of Wight and in Gloucestershire. As regards the London district, the latter insect was recorded from Riddlesdown, Surrey, many years ago.—A. A. ALLEN, 63 Blackheath Park, London, S.E.3. 14.x.1959.

STERRHA RUSTICATA SCHIFF. BREEDING IN S.E. LONDON.—By way of an appendage to Mr. A. J. Showler's interesting paper on *S. rusticata* (1955, *Ent. Rec.*, 67: 45-7), I may say that the m.v. lamp (very kindly lent by my friend Mr. Dudley Collins) which I have used here on most suitable nights this summer has revealed—amongst other unexpected things—the presence in our immediate neighbourhood of that curiously local little moth. It occurred on several dates in June and July, never more than two per night, and much more often singly, but quite frequently enough to show that the species is established here.

There have been one or two isolated records for places nearer the centre of London, but only (at least in this century) as odd stragglers; so that it seems likely that Blackheath is about the western limit of its present range in North Kent. Among various species formerly included in *Acidalia*, occurring in the garden here in past years (of which the most local are *Sterrha trigeminata* Haw. and *Scopula marginepunctata* Goeze, though they do not necessarily breed there) I have never met with *rusticata*, so that the moths evidently come from a little further off—as many others that have come to the lamp undoubtedly do. The favourite habitat of the species in its North Kent headquarters, namely high banked lanes shut in by elm hedges—does not exist hereabouts, but there is plenty of elm nearby, including a fairly thick hedge at some little distance.—A. A. ALLEN, 63 Blackheath Park, London, S.E.3. 14.x.59

MARGARONIA UNIONALIS HUBN. IN THE LONDON AREA.—A female in good order of this ethereal-looking scarce immigrant Pyrale (also known as *Palpita unionalis*) turned up at m.v. light here three nights ago and the following day was transferred to a roomy perspex pill-box along with a spray of winter jasmine—the only kind immediately available. The next night, i.e. after a lapse of nearly 24 hours, rather numerous flat waxy-looking greenish-white eggs were found, singly and in batches of a few, deposited on the sides of the box—fewer on the top and bottom—but, oddly enough, *not* on the jasmine as far as a cursory inspection shows except for one, apparently, on the underside of a leaf. Whether the larvae (if any hatch) will eat the winter jasmine remains to be seen; possibly the related *Forsythia*, of which there is plenty here, might serve as an acceptable substitute.

I do not know what may be the present status of *M. unionalis* in suburban West Kent, or in the environs of London in general, but do not remember seeing a previous record; the majority of captures are, of course, on or near the coast, and seem lately to have been concentrated in south Essex. However, Mr. D. Collins has taken at least two specimens at m.v. light at Carshalton, Surrey, during the past five years. One of these, which with many other good "micros", he has most generously presented to me, bears the date 22.viii.55.—A. A. ALLEN, 63 Blackheath Park, London, S.E.3. 14.x.1959.

Our experience is that larvae of *M. unionalis* will readily eat winter jasmine, and we have raised a brood on this food-plant without the slightest difficulty.—ED.

PALPITA UNIONALIS HUBN. IN HERTS.—We had the pleasure of taking a male *unionalis* in the trap in the garden last Saturday (10.x.1959) at Arkley. There must be a good number over this year.—G. HOWARTH, Arkley, Herts. 13.x.1959.

AUTUMN 1959 IN THE REIGATE AREA.—Most of us must have expected an invasion of some moth this hot summer to compare with that of *Rhodometra sacraria* Linn. in 1947 but immigrants appear to have been scarce, at least here (except *Nomophila noctuella* Schiff which has been constant since May). In the trap I had one *Nycterosea obstipata* Fabr. on 22nd August but nothing else of note until October 8th-9th when a *Leucania albipuncta* Fabr. was taken. On 11th October I found about 400 *N. noctuella* with one *Palpita* (*Margaronia*) *unionalis* Hübner. We have seen a few *Macroglossum stellatarum* Linn. since the 24th September, the first for some years, but no *Herse convolvuli* Linn. have attended the *Nicotiana* bed. A second *P. unionalis* appeared on the 18th October. There has also been a marked absence of butterflies at the usual attractions (Asters, etc.) in this area this autumn.—R. FAIRCLOUGH, Blencathra, Deanoak Lane, Leigh, Surrey. 19.x.1959.

BLACK TOM'S LANE.—Dr. Birkett's article on Witherslack (*Ent. Rec.*, 71: 197) was doubly interesting to me as I have had a number of nights at Black Tom's Lane in recent summers seeing the species he mentions, although on my first visit, in July 1948 (with a pressure lamp only) I had only two moths. This year on 10th August I took the m.v. there on a cloudy thunder-threatening night with the temperature still 61° F. after midnight. Fifty-seven species were recorded, a pleasant contrast to the numbers I had been experiencing in Merioneth in the previous fortnight. There were two surprising species among the fifty-seven, *Hydraecia petasitis* Doubl. and *Arenostola phragmitidis* Hübner. The first is a moth that seems greatly given to lurking in the butterbur, and I had not thought there was any near, while the Wainscot (incidentally the only one of the group to appear) seems a long way north. I wonder if Dr. Birkett has recorded it?—R. FAIRCLOUGH, Blencathra, Deanoak Lane, Leigh, Surrey. 10.x.1959.

EMERGENCE OF *HYLOICUS PINASTRI* LINN.—With reference to Mr. L. H. Newnan's letter in the October *Record* (*antea*, p. 244) I remember the late Mr. Leslie Burt told me in the 1930s that some of his four *pinastri* had emerged unexpectedly in August: the pupae had been put away for the winter in a box with some moss and the moths had not been able to develop their wings properly. I do not remember the date, but I think it was 1933 or 1934, both hot summers. In marked contrast to this, Mr. Percy Cue bred a *pinastri* this year from a 1956 larva.—H. SYMES, 52 Lowther Road, Bournemouth. 17.x.1959.

COSMOLYCE BOETICUS LINN. IN SURREY.—I should like to record my capture of a perfect female *C. boeticus* (long tailed blue) at Guildford on 14th October. It came over a hedge and settled on a stubble field sprinkled with lucerne, on the stubble quite near to me. It was at 3 p.m. on a still, hot and sunny day, after several dull and sunless days. I think this must be the latest date recorded here for this species. I was only just in time to take this insect, for I had not moved a dozen paces when the West Surrey beagles and followers suddenly appeared through a gap in the hedge and swarmed across the very spot where I had netted it.—E. E. JOHNSON, Highfield House, Portsmouth Road, Guildford. 18.x.1959.

HOW MANY NYCTEOLEA = SARROTHRIPUS SPECIES INHABIT BRITAIN?—As long ago as 1907 it became apparent that under the omnibus-name "*Sarrothripus revayana* Scop." at least two good species, *revayana* Scop. and *degenerana* Hubn. inhabited Europe. The latter was not recorded from Britain until 1950 when Dr. Cockayne (*Entomologist*, **83**, p. 123, Pl. iv) reported that it inhabited the New Forest.

In 1958 Mons. C. Dufay published two articles of interest in this connection:—(i) Mise au point de la synonymie des *Nycteola* (*Sarrothripus*) européennes (*Bull. Mens. Soc. Linn. de Lyon*, **27**, 4, pp. 108-118); (ii) Révision des *Nycteola* Hbn. Paléarctiques (*Ann. Soc. Ent. France*, **127**, 107-132; with 2 half-tone plates of *Nycteola* forms and two other plates of both sexes' genitalia).

From these it appears that six distinct species of this group inhabit Europe. In addition to the two already mentioned, three of these species may be mentioned here: *siculana* Fuchs (= *dilutana* Hubn.) which, like *degenerana*, feeds on poplars and willows; *asiatica* Krul., of similar foodplant; and *columbana* Turner (described in *Ent. Rec.*, **37**, p. 77, 1925, as a race of *revayana* inhabiting S. France) which, like the true *revayana*, is an oak-feeder. It appears however that, unlike *revayana*, *columbana* is a West Mediterranean species, monophagous on cork-oak.

Whether *siculana*, *asiatica* and *degenerana* inhabit Britain in addition to *revayana*, which is the most variable species in the genus, is left open. In his second article Dufay says that Cockayne's records of *degenerana* might well in fact refer to *siculana* f. *svecicus* Bryk. In a letter to me, Mons. Dufay states that *asiatica* is now known from Belgium and therefore possibly inhabits Britain.

It seems desirable that all British specimens should be re-examined in the light of the above revision. I understand that Mons. Dufay (whose address for receiving material is: Observatoire de Lyon, St. Genis-Laval, Rhone) will be glad to examine and give his opinion about doubtful *Nycteola* forms. It seems that the British Museum's material of this genus which was sent to him for his revision included many forms from many countries but comparatively few from Britain; these few were all *revayana*.—E. P. WILTSHIRE, POB. 114, Bahrein. 27.ix.1959.

DIACRISIA SANNIO L.: PREPONDERANCE OF FEMALES.—On 20th June a series of *D. sannio* was taken at Witherslack. Five females were kept for ova which were duly laid during the next two or three days. The larvae commenced to hatch from the eggs on 28th June. At first all the larvae fed at the same rate but it soon became apparent that some, the minority, would attain the pupal state before late summer whilst the large majority would go into hibernation as larvae about one-third grown. Pupation of the fully-fed larvae commenced on 13th August and the first emergence took place only eleven days later. From the total of 41 insects to emerge this year, 35 were females and only six were males. Can anyone please explain why the second brood of this species, when reared in captivity, should produce a ratio of almost 6 : 1 females to males? Perhaps I should add that all the pupae emerged except one which failed to shed the larval skin correctly.—M. J. LEECH, "The Spinney", Freshfield Road, Formby, nr. Liverpool, Lancs.

TRIPHAENA PRONUBA L.: A SUGGESTION.—Although my connection with the macros is but an old, though still glowing, love, I sometimes cannot help thinking a little about the problems in this group. For some years I have speculated as to the specific standing of *Agrotis* (*Triphaena*) *pronuba* L. and the ab. *innuba* (the unicolorous red form). Seitz uses the reverse designation from that which we use in Denmark. Have these ever been examined in detail? I have always had the feeling that the unicolorous *innuba* is a species different from the typical *A. pronuba*, and from my notes I can see that I have always caught *innuba* about a month before *pronuba* occurred. What do you think about it? Another thing, what about the *innuba* from coastal areas with the green base to the forewings? I have seen it rather often, and it has always looked very odd to me; I have never heard that it has its own name. Do you know if it has a name?—A. G. CAROLSFELD-KRAUSÉ (*in litt.*), 97 Slotsherrens Have, Vanlose, Copenhagen. 6.x.1959.

[Tutt (Br. Noct. and their Vars., II (1892) pp. 99-102) deals with the forms of *T. pronuba* L. in much detail. Can any of our readers inform us about more recent work on the subject of this species?—Ed.]

BRITISH ENTOMOLOGISTS AND THE BRITISH FAUNA.—Very many thanks for the *Record*, which I received last week, and I have wondered a little at all the talk about what English lepidopterists will do when the m.v. lamp has done it all. When I read the *Record* I wonder at the curious insect fauna England has and what a lot the British entomologists have to do in studying the odd biological conditions which occur in England. As a single example, the fact that *Abraxas grossulariata* L. in some place in England is living on *Calluna* sounds so incredible to a continental entomologist as if he had heard that the spotted seal lives on strawberries. If such an odd thing should happen here, we would not rest until we had got that curious population examined in detail. This is not the only extraordinary thing found in the British fauna, but I have the impression that British entomologists have not yet found out what a remarkable fauna your island possesses, and how much is to be done in examining all these odd facts. I think that this may be due to the iniquity of the fathers who, on account of the national British smog, have not been able to see that these insects live quite differently on the continent, but I am glad to see that the fog is now lifting so that the new generation of entomologists in England gets a broader view of things. This will give them a lot of work in the future studying that most remarkable fauna in Europe, which they have been in the habit of regarding as quite a common thing.—A. G. CAROLSFELD-KRAUSÉ (*in litt.*), 97 Slotsherrens Have, Vanlose, Copenhagen. 6.x.1959.

PLUSIA AURIFERA HUBN. IN NORFOLK.—A male specimen of this species, in perfect condition, came to m.v. light here on the night of 13th October. This would appear to be only the fourth specimen of this rare *Plusia* to have been recorded from this country.—R. G. Tonn, West Runton, Cromer. 19.x.1959.

A NOTE ON THE BEHAVIOUR OF *APATURA IRIS* L.—Since my last note (*antea*, p. 101) similar incidents of the behaviour and peculiarities of this insect have occurred, which might be worth putting on record.

On 15th July a male was noted flying round a stationary farm tractor at about 4.30 p.m. It eventually settled on a wing of the vehicle, where an attempt was made to capture it, but, undismayed by this and further frantic efforts to capture it, the butterfly returned to the selected resting place on the tractor wing three times before gliding away to the topmost branches of a near-by oak completely unscathed and apparently tired of the performance. A few days later and within a stone's throw of the previous incident a perspiring woodman was visited by a purple emperor, about the same time of day, which persistently flew about him before actually settling on his bare back, where a desperate effort by a colleague to capture the butterfly with a tattered beret resulted in a rash swipe across the woodman's unprotected back.

Earlier in the season, whilst discussing the unpredictable behaviour of *iris* and its partiality for motor vehicles with Baron de Worms, he informed me that this attraction to automobiles has been frequently noted by other collectors and it has been suggested that the petrol fumes may lure the butterfly. In my own opinion, it seems that this may be only contributory, for it is equally well known that this species is attracted at all times by anything conspicuous lying about its territory, such as a sheet, old pieces of paper or sacking, etc. This may, of course, be purely inquisitiveness, but these objects are more frequently visited when in the full glare of the sun, which, no doubt, reflects a little extra warmth; even a tarmac road serves the same purpose, especially in the late afternoon, for an insect seeking additional warmth. This habit is, of course, in no way connected with the insect's known liking for foul baits, though this would account to the visit to the perspiring woodman.—C. M. R. PITMAN, Malvern, Southampton Road, Clarendon, Salisbury, Wilts. 20.viii.1959.

XANTHORHOE FLUCTUATA LINN., AB. *COSTOVATA* HAWORTH.—*Xanthorhoe fluctuata* Linn. seems to be one of the most successful species of macro-lepidoptera in the district of North-East Derbyshire which is described as the centre of Industrial England, so it is surprising to find that it retains its white and black coloration even though it rests on trees and walls during the day. There is no sign of industrial melanism in this species in this area at any rate. In fact, so far from becoming all black, there has been an indication of a trend in the other direction this season. I was pleased earlier on in 1959 to find in my mercury vapour light trap two good specimens of the variety in which most of the black markings are absent. It is figured in South, plate 61, and named ab. *costavata* Haworth.

Altogether 1393 specimens of *X. fluctuata* were taken in the same trap in my garden between 23rd April and 2nd October 1959, but these were the only noteworthy variations among them. I tried to obtain eggs from them but failed. However, now that this aberration has appeared in this district, it might be profitable to collect and rear as many larvae as possible of this common species.—J. H. JOHNSON, F.R.E.S., 1 Berry Street, Hephthorne Lane, Chesterfield, 15.x.1959.

POSTSCRIPT FROM BOURNEMOUTH.—Since writing my "Notes from Wessex" I have seen *Macroglossum stellatarum* Linn. several times in my garden, mostly at lavender. The dates were 28th and 30th September and 2nd, 3rd, 7th, 14th, 15th and 16th October.

My great surprise came on 14th October. I went into the garden just after 12.30 p.m. and saw a white butterfly at the lavender. I assumed it was the usual *Pieris brassicae* Linn., but on taking a second look at it I saw it was *Colias croceus* Fourc. var. *helice*, and when captured it proved to be in perfect condition.—H. SYMES, 52 Lowther Road, Bournemouth. 17.x.1959.

A WEEK AT PORT ERIN, ISLE OF MAN.—During the last week of July 1958 my wife and I, in company with Mr. A. J. Wightman, decided to travel to the Isle of Man in search of *Hadena caesia* Schiff. ssp. *manani* larvae. We left our car at Liverpool and had quite an uneventful four hours' journey by sea, and arrived at Port Erin by late evening, having completed the trip from Sussex in the day. As we had planned to work a limited coast line of about 12 miles, in the south of the Island, we were able to use ordinary omnibus conveyance to certain points, from which we walked to the rocky coast, selecting suitable places where the foodplant (*Silene maritima*) grew. For anyone wishing to get this larva, I would advise looking under the small isolated pieces of *Silene*, which grow in a minimum of soil or shale, on the shallow ledges of the rocks, in preference to the larger clumps of the foodplant. The clambering about the rocks is not easy and rather hard on the knees and feet, but well worth the effort with a view to breeding the moth in perfect condition. Larvae were found in all stages from very small to over half grown. Contrary to other reports that the larvae should be isolated in small tins in confinement, Mr. Wightman and I found this to be utterly wrong. I kept mine in large baking tins with a liberal supply of the *Silene* leaves, flowers and pods, all of which they eat, and no signs of cannibalism occurred. We also had a boat trip from Port Erin to the small island known as the Calf of Man, and searched rocks in various places, but failed to locate any larvae, probably due to so many birds, this Island being under the National Trust. It was interesting to note that the larvae of *Cucullia chamomillae* Schiff. were still feeding at this date on *Matricaria*.—L. E. SAVAGE, 65 Cranmer Avenue, Hove, 4. 5.x.1959.

RELEASE OF NYMPHALIS ANTIOPA L. IN KENT.—In common, I feel sure, with many other entomologists, I cannot admit having read with any degree of pleasure of the release of 286 Camberwell beauties, of Italian origin, at Lullingstone in Kent; much as I should enjoy seeing this lovely insect as a genuine native in the British Isles. It is, indeed, difficult to comprehend how such action can have been taken in these days when it is so generally appreciated that artificial introductions are bound to confuse the work of entomologists engaged in the study of insect movements, both by temporary migration and by gradual but permanent infiltration. We are told that the released insects are marked on the wing tips with a waterproof green dye, but of what use is this, for identification purposes, unless an insect can be caught and examined or at least observed closely when settled.

Neither procedure may be possible. It is, perhaps, significant that two days after the release of these butterflies a Camberwell beauty was seen at Eynsford in Kent (*Entomologist*, 92: 184). Was this a genuine immigrant or an Italian internee? Moreover, in the, fortunately, unlikely event of any of these insects surviving the damp of the English winter in hibernation, who will arrange for the wing-tips of their progeny to be marked with green dye?—E. S. A. BAYNES, 2 Arkendale Road, Glenageary, Co. Dublin.

The turning down of insects has its opponents and supporters, its pros. and its cons., and various insects have been the subject of such experiments. The unnatural slaughter of insect populations by hysterical use of insecticides must bedevil equally the studies of ecologists, and, personally, I can put down bred surplus British insects in a place where they are likely to survive without a blush.—ED.

NEW NATURE RESERVES.—The report of the Nature Conservancy mentions seven additions to our nature reserves: two are in Wales. Coed Camlyn Nature Reserve in the Vale of Festiniog is mainly sessile oak in a heavy rainfall district; permits from The Regional Officer of North Wales, Nature Conservancy, Y Fron, The Crescent, Upper Bangor, Bangor: and Craig-y-Cilan Nature Reserve, high on the side of the Usk valley, with permits from The Nature Conservancy, c/o Department of Zoology, University College of Swansea, Singleton Park, Swansea. Two are in Scotland, Haaf Gurney for sea birds, and Kirkconnel flow, Dumfries, which represents a small remnant of raised bog with Scots pine and birch woods, and is said to be particularly interesting from an entomological point of view.

Three additions to English reserves include an extension of the Blean Wood reserve: this area is coppiced woodland and it is the intention to continue the coppicing, which is excellent for the insect populations. Permits from The Regional Officer for the South East, The Nature Conservancy, 19 Belgrave Square, London, S.W.1. Another extension is of the Morden Bog Reserve in eastern Dorset, with permits from the Regional Officer for the South West, Nature Conservancy, Furzebrook Research Station, Wareham, Dorset. Wynbury Moss Nature Reserve extension in south Cheshire is not open to the public but permits may be obtained from the Regional Officer for the North, Nature Conservancy, Merlewood Research Station, Grange-over-Sands, Lancashire.

With regard to the New Forest, an agreement has been reached between the Nature Conservancy and the Forestry Commission, and concerns the preservation of Denny Wood, Denny Bog, Matley Heath and Matley Wood, and in these places it would seem that the natural hardwoods will be allowed to remain. Mark Ash Forest and Bramshaw Forest Nature Reserves will also be treated similarly.—ED.

ACHERONTIA ATROPOS L. IN LANCASHIRE.—It is I think worth recording that a fully-fed larva of *A. atropos* was found in a potato field near to Ormskirk on 12th September 1959.—M. J. LEECH, "The Spinney", Freshfield Road, Formby, nr. Liverpool, Lancs.

Picture on silk

In modern Japan, the traditional arts still apply. Not least in the manufacture of silk, the production of which is an important industry in Japan. Equally important to many Japanese farmers is the cultivation of mulberry leaves, sole food of the silkworm.

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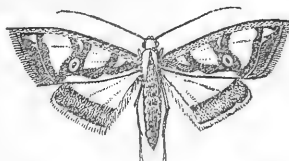
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THE ENTOMOLOGIST'S RECORD

AND JOURNAL OF VARIATION

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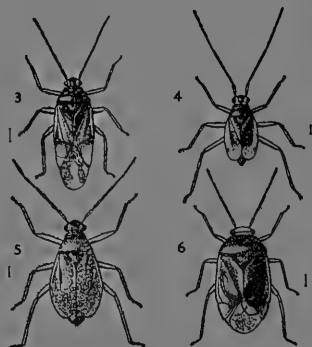
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Some Observations on the Crimson Ringed Butterfly (*Parnassius apollo* L.) in Britain

By A. M. MORLEY and J. M. CHALMERS-HUNT.

THE FOLKESTONE SPECIMEN

P. L. Scott's capture of this insect which he generously presented to the Folkestone museum, was announced in this magazine (*Ent. Rec.*, 67: 273). Since it may well have caused a certain amount of discussion it might be useful to add some further information about the specimen and to examine the history, so far as it can be regarded as history, of previous appearances of *Parnassius apollo* L., in Great Britain.

Three facts about this particular specimen are of possible significance:—

- a) Though by no means in bad condition, it is somewhat worn and had evidently been out of the chrysalis for several days, at least.
- b) It had already paired, as can readily be ascertained with the females of this species.
- c) It is rather large, and the rings on the hindwings are of a good size.

From (a) it may be gathered that if it had been bred in this country it had escaped notice for some time:

(b) makes it most unlikely that it was bred here, and as to (c), Mr N. D. Riley compared it with the series in the British Museum, Natural History, and wrote the following note: "It does not agree with the Scandinavian sub-species. It agrees best with the race of Central Europe, occurring in south Germany and extending east and west into France and Austria, north of the main Alps. This is called by most authors *melliculus* Stichel."

Dr E. Scott compared it with his series from Finland, which at first sight it resembles rather closely. Detailed examination however, suggested that it does not belong to this particular race. Mr B. C. S. Warren went through his fine collection of *apollo* from various parts of Europe and found only one real parallel, the race from the Jura mountains in France.

This gives a probable, but no means certain locality for the specimen; there are very many races of *apollo*, even two or three in one country, but individuals vary in each race, and two races may overlap.

OTHER RECORDS OF P. APOLLO

Edward Newman in his *British Butterflies* (1871) includes a number of records of *apollo* the earliest of which seems to be contained in a quotation from Haworth's *Lepidoptera Britannica* (1803). "I have recently heard that *Papilio apollo* of Linnaeus has been found in Scotland, but I have not seen a British specimen." Newman adds that Donovan included this species in his *British Insects* (1793-1830).

This particular record has been regarded with scepticism, for Wood in his *Index Entomologicus* (1854) says: "introduced by Donovan as British, but without sufficient authority," and Westwood in his *Butter-*

flies of Great Britain says: "Erroneously stated to have been taken in the Hebrides, and more recently said by Duncan to have been seen on the west coast of Scotland."

Newman included in his addendum six notes by J. C. Dale on specimens he had heard of. Only the first has a date, "1812 or about that date," the fifth gives no locality, and the sixth relates to one taken in Cornwall by Sir C. Lemon, who suggested that it might have been imported with plants in his hot-house. This gives a total of eight reported appearances of the butterfly at the end of the eighteenth or in the early part of the nineteenth century, of which six are attributed to Scotland. We need not infer that the Scots have more imagination than the English, or that the species was at one time indigenous in Scotland, the climate of which, Mr Warren says, is quite unsuitable for it. A more likely explanation is perhaps to be found in a part of a sentence from Kirby's *European Butterflies and Moths* (1898):—"Attempts to introduce it in localities where it is not indigenous have hitherto failed."

Newman concludes with two quotations from the *Zoologist* for 1856. The first is a note from G. B. Wollaston (p. 5001) who describes in some detail how a specimen, which he had actually examined, was caught on "the cliffs at Dover" (according to S. G. Hills (1925), the cliffs above the Folkestone Warren) in 1847 or 1848. The second is a short note (p. 5109) by H. Austin to the effect that one was seen at Hanwell about 1850.

Of these ten records, one only, the Dover or Folkestone record, would be accepted as evidence in a court of law, for the rest depend on hearsay. Newman's summing-up is hardly surprising: "I cannot consider them to warrant me placing the species in the British List", a judgment that has been endorsed by his successors.

It is unfortunate that not one of these insects was seen in flight or captured by a recognised entomologist, and only one was examined as a specimen. We do not know whether any of them now exist in collections. It is possible that they have all disappeared. None the less, there is no reason to doubt that *P. apollo* has from time to time been taken in the British Isles. Some of the specimens said to be in collections may well have been imported from abroad, not a rare occurrence at a time when data labels were not commonly used, and some of the records may have been due to mistaken identity, though this is rather unlikely with so striking an insect, especially as a hundred years ago it was known as the crimson ringed butterfly.

It also seems pretty certain that specimens were at one time released in Scotland with a view to establishing the species there. Making due allowance for such examples we may still conclude that on one or two occasions *apollo* was actually seen or taken in this country, without coming under these categories. It is commonly assumed that such specimens were bred from larvae or pupae introduced either accidentally or intentionally from abroad, and this is a reasonable hypothesis. For the hundred odd years since the last date mentioned, there seems to be very little information. No doubt there may be records, or even specimens which are not generally known, but all we have so far discovered is a note (*Entomologist* 58: 15: 1925) in which Mr J. H. Craw said that in mid-August 1920 he took an *apollo* in Wiltshire and was writing on the suggestion of Dr J. Ritchie of Edinburgh. The editorial comment

runs: "No doubt imported, probably with alpine plants in the pupal stage." We might leave it at that if it were not for the fact that in recent years we have had some unexpected insect visitors in various parts of the country which are considered to have been brought here, sometimes from a great distance, by air. In 1955, with its frequent north and north-easterly winds, there can be little doubt that many of these strangers came from north-west Europe. In view of what is known about the latest *apollo*, it is fair inference that it also came with the wind.

CONCLUSIONS

(1) The number of records is too large to be ignored, even though some are vague, some suspect, and some may refer to foreign specimens. Moreover, it seems that there may have been other individuals that were seen or captured in Great Britain, but of which there has been no notification in print.

(2) We may agree that specimens have from time to time occurred in Great Britain, but that does not tell us how they got here. The usual explanation that they were imported as larvae or pupae is most probably true in many instances, but not necessarily in all.

(3) The fact that all the very early "records" are of specimens in the Highlands or Islands of Scotland, and that there have been none since early in the last century from this area, strongly suggests that there was an attempt made—possibly on more than one occasion—to introduce the species into Scotland.

(4) Of the fairly numerous later records, it is remarkable that the great majority relate to the south-east or east of England, particularly to south-east Kent. There is no reason to suppose that alpine gardens predominate in this part of England, nor that its inhabitants are particularly prone to bring larvae or pupae of this species when they return from visits to the Alps.

(5) It is pretty certain that many insects from north Europe visit this country from time to time, especially in periods of north-east or east winds, and among them may be specimens of *P. apollo*. The race to which the 1955 specimen belongs flies at a lower level than most of the races, and is therefore more likely to be windborne at times.

(6) It is most unlikely that P. L. Scott's specimen was bred in this country or that it came by train or boat, since the boat trains do not run from the Jura, nor does it seem likely that it came by aeroplane. This leaves two alternatives; either it was introduced as a living specimen for some reason that is not easy to guess, or it was brought by the wind.

(7) On the whole, it seems as reasonable to include this species on the British list as certain others that are on that list.

SUMMARY OF REPORTED OCCURRENCES

Altogether there are published notices of about twenty specimens of *apollo*. Probably some records refer to the same specimen, and we have indicated where this appears to us to be the case.

(1) According to Wood and Westwood (*Index Entomologicus* 1854 p. 243) introduced by Donovan as British, but without sufficient authority. Edward Newman (*Br. Butterflies*, addendum) gives Haworth (*Lepidoptera Britannica*, preface p. 29) as saying that he had heard of

apollo having been found in Scotland, but that he had not yet seen a British specimen. Also Haworth (*Ent. Trans.* 1: 232) and Donovan (*Brit. Insects* 13: 443). Stephens (*Haustellata* 1: 26) states that it is said by Donovan (from the notice in Haworth's *Lep. Brit.*) to be a native of the Isle of Lewis, but from information subsequently obtained from Professor Hooker, it appears that the specimen was in a box of insects sent from Norway.

(2) Westwood (*Brit. Butterflies* [1841] 12) says Duncan states it had been seen on the wing on the west coast of Scotland in the summer of 1834.

(3) In 1812 or about that date, *apollo* said to have occurred in the Isle of Lewis. J. C. Dale (Newman *loc. cit.*).

(4) Haworth informed J. C. Dale, that a lady told him she had received a specimen from some alpine place on the west coast of Scotland (Newman *loc. cit.*),

(5) Mr Curtis saw one at the foot of Ben Lawers, J. C. Dale (Newman *loc. cit.*).

(6) J. C. Dale was told of a specimen in Sir C. Trevelyan's collection (Newman *loc. cit.*).

(7) J. C. Dale was told of a man who had taken it in Lewis or Harris (Newman *loc. cit.*).

(8) A specimen was taken in Cornwall by Sir C. Lemon, who thought it might have been imported with plants in his hot-house. J. C. Dale (Newman *loc. cit.*).

(9) In a letter to Edward Newman, G. B. Wollaston stated he had seen one which was taken on Dover cliffs in 1847 or 1848 (*Zoologist*, 5001).

(10) H. Austin reported that he met a man who had seen one at Hanwell about 1850 (*Zoologist* 5109).

(11) One taken by the son of G. B. Holmes at Epping about 1847 or 1848 (*Entomologist* 6: 39).

(12) E. Sabine states that his son saw one at Dover on August 28th 1889 (*Entomologist* 22: 278).

(13) One taken by J. H. Crow on Sidbury Hill, near Avebury, Wilts., mid-August 1920 (*Entomologist* 58: 15).

(14) One was captured by Mrs Webb on the coast at Thorp, Suffolk, September 10th 1928 (Vintner; *Trans. Suffolk Naturalists' Soc.* 1: 13).

(15) A. F. Common writes that he bought a cabinet containing an *apollo* labelled "captured behind St Margaret's Bay, 1889. E. Clarke" (*Entomologist* 68: 212).

(16) One taken by P. L. Scott in the Warren, Folkestone, August 3rd 1955 (*Ent. Rec.* 67: 273).

(17) } One or two near Portishead, Somerset (Barrett *Lep. Brit. Isles*
(18) } 1: 311).

(19) Larva captured at Ambleside by Weaver (Barrett *loc. cit.*).

(20) One found dead on a pavement in Tavistock Square, London W.C. I. on September 26th 1957 by D. P. Ransom (*Entomologist*: 90: 297).

Some Dorset Notes for 1959

By Brigadier H. E. WARRY

It was a very early spring, as stated by me in the April Record (*antea*, p. 111). The consequence was that April was almost a blank. Emergence in May was about normal, but in June, July and August, insects emerged about three weeks earlier than usual, but for some unknown reason, the autumn insects emerged later than in other years. Although a fair number of species have been recorded, the total number of insects seen has been much smaller than in most years, and there has been no plague of any one particular species.

Hibernating butterflies were seen at the end of February and during several days in March, so all looked promising for a good display in the autumn on the Michaelmas daisies, etc., but what a disappointment was in store—20 *Vanessa atalanta* L.; 6 *Aglais urticae* L.; 4 *Polygonia c-album* L.; and 2 *Nymphalis io* L. were the most I saw on any one day. *Vanessa cardui* L. was not seen in the autumn, although some were seen earlier in the year. *Lycaena phlaeas* L. was more plentiful than usual.

On 26th May I visited some rough ground outside a wood in north Dorset with Mr. Symes and Miss Pengilly. *Argynnis euphrosyne* L., *A. selene* Schiff., *Euphydryas aurinia* Rott. and *Hamearis lucina* L. were all plentiful and in good condition, and we managed to get some nicely marked *aurinia*, which on the whole were smaller and darker than those I have taken at Hod Hill. This autumn, Michaelmas daisies and *Sedum spectabile* did not seem to have any attraction for butterflies, although bees were working the flowers normally. Last year I counted 60 *A. urticae* beside *atalanta*, *io* and *cardui* on three plants of *Sedum spectabile*.

My best night with the m.v. lamp at Upwey was 25th June when 62 species were recorded, and on 23rd, ten other species were noted that did not appear on 25th. The most interesting records for Upwey were:

<i>Harpyia hermelina</i> Göze (one)	23rd June
<i>Cerura vinula</i> L. (one)	4th June
<i>Stauropus fagi</i> L. (one)	23rd June
<i>Tethea ocularis</i> L. (four)	30th May, 29th June, 4th July (two)
<i>Asphalia diluta</i> Schiff. (one)	5th September
<i>Leucoma salicis</i> L. (one)	4th July
<i>Comacla senex</i> Hub. (one)	4th July
<i>Lithosia quadra</i> L. (ten)	7th July (two), 21st July (two) 24th July (four), 31st July
<i>Apatele alni</i> L. (two)	30th May
<i>Agrotis trux</i> Hub. (one)	23rd June
<i>Dasyptolia templi</i> Thun. (one)	6th October
<i>Griposia aprilina</i> L. (one)	11th October
<i>Nonagria geminipuncta</i> Haw. (three)	24th July
<i>Leucania l-album</i> L. (one)	3rd October
<i>Plusia festucae</i> L. (six)	4th, 6th and 25th June, 8th August (two), 1st October

Nomophila noctuella Schiff. was plentiful, and I took two *Margarona unionalis* Hub. on 23rd October and 1st November respectively. My first record of this insect was on 2nd October 1956.

On 2nd October I went down into my cellar to shut the outside door, which had been left open for several weeks. The place was full of mosquitoes, and on the ceiling I noticed some larger insects. On closer examination, I saw they were seven *Scoliopteryx libatrix* L. and one *A. urticae* all huddled together. There were four more *libatrix* dotted about elsewhere on the ceiling; I take it they were hibernating. Is it common to find so many in one place? It would seem that *libatrix* is more common than one might suppose. Personally, I doubt whether I have previously come across more than a dozen during my twelve years in Upwey.

This year, larvae have also been scarce, but I managed to get a female *Coscinia cribraria* L. and a female *Diacrisia sannio* L. on a heath in east Dorset and both laid some eggs for me. I am now trying to get both lots of larvae through the winter.

With regard to the hibernation of *S. libatrix*, we recollect a report of something over thirty specimens hibernating together on the ceiling of an air raid shelter which was being demolished. We regret that the actual reference escapes us.—Ed.

The Isle of Wight Revisited

By S. WAKELY

After a lapse of some years I was fortunate enough to be able to arrange this year for my summer holiday to be in the Isle of Wight. The first fortnight in July was chosen, and together with my family we made our headquarters at The Duver, St. Helens, on 4th July. Our bungalow was at the end of a golf course which had known better days and although the greens were kept in first-class condition we never saw anyone playing there. Being situated on a small sand dune, it was not surprising to find masses of Sea Buckthorn growing along the edge of the seaward side.

On the 9th we were joined by Dr. D. A. B. Macnicol and we went on several interesting trips together to various parts of the Island. We were both keen on the microlepidoptera and found several species not hitherto recorded for the Island. It is difficult to find out if a species has been noted previously as there are so many publications which one has to search. If any reader has ever taken any of the insects mentioned as new records I would like to hear about it.

First of all there are two macros which appear to be new, namely *Nola albula* Hb., three specimens of which came to our blended m.v. lamp, and *Tholomiges turfosalis* Wocke, represented by a solitary example. Owing to its small size one feels that this is often mistaken for a micro and overlooked.

There were nine species of micros which I think are new. These were: *Acentropus nivea* Ol. (several specimens), *Epitheatia mouffetella* Stt., *Gelechia velocella* Dup. (some at light and others taken by smoking out of the short herbage on the golf course), *Anarsia spartiella* Schrank (several), *Borkhausenia fuscescens* Haw. (several very small specimens on windows at the bungalow), *Depressaria cinicella* Treits. (this wants verification as the only specimen seen on the sheet eluded me, but there was plenty of Sea Holly not many yards distant and some of

these plants showed signs of larval feeding places). *Lithocolletis geniculella* Rag. (larvae not uncommon in leaves of sycamore at the top of Luccombe Chine), *Ypsolophus xylostellus* L. (one only), and *Opostega salaciella* Treits. (several at light).

Although it has been such a wonderful summer, species were not nearly as numerous as in some years, and most of the species taken were singletons.

A log was kept of the species noted at light and they totalled 136 in all. The following is a list of the more interesting ones not already mentioned: *Tethea ocularis* L., *Euproctis chrysorrhoea* Hb., *Leucoma salicis* L., *Apatele leporina* L., *Craniophora ligustri* F., *Cryphia muralis* Forst. (four), *Agrotis vestigialis* Rott. (pale form), *A. ripae* Hb., *Euxoa tritici* L. (the commonest noctuid and large well-marked specimens), *Nonagria dissoluta* Treits., *Coenobia rufa* Haw., *Leugania littoralis* Curt., *Laspeyria flexula* Schiff., *Epirrhoe galiata* Hb. (the commonest geometer), and *Plagodis dolabraria* L. Except where numbers are given, these were all single specimens. We saw less than half a dozen of such a common species as *Triphaena pronuba* L. during our fortnight's visit!

To continue with the micros which came to light, again mostly single specimens, we noted: *Dolicharthria punctalis* Schiff., *Anerastia lotella* Hb. (three, including a dark specimen with pronounced white costal streak), *Platytes alpinellus* Hb., *Peronea hastiana* L. (several small ones of first brood, including a striking form with broad white central vitta), *Polychrosis fuligana* Schiff. (confirming Meyrick's mention of the Isle of Wight as a locality), *Endothenia ericetana* Westw., *Eucosma citrana* Hb. (numerous), *Eucosma expallidana* Haw., *Aristotelia pictella* Zell. (also by smoking out on golf course), *Monopis ferruginella* Hb. and *M. imella* Hb. (confirming a very ancient record mentioned by Morey).

There were several large clumps of Common Mallow (*Malva sylvestris*) growing under the windows of the bungalow, and the larvae of the local *Platyedra vilella* Zell. were quite common in the seeds. Several lots were collected and sent to friends and I bred a number of moths later myself. Unfortunately over fifty per cent. produced a large ichneumon fly. Pupae of *Nonagria sparganii* Esp. were quite common in stems of Typha and Sparganium in a wide ditch bordering the old disused railway track by what was at one time St. Helens railway station. It is necessary to remove the pupae from the plant in which they are found, otherwise the stems contract and crush the pupae. I lost several some years ago through not knowing this. *Alucita pentadactyla* L. were common at dusk flying round a large clump of the sea bindweed (*Calystegia soldanella*) and I strongly suspect this was their foodplant on the dunes. Galls in stems of hemp agrimony were found near the bungalow, and several specimens of *Adaina microdactyla* Hb. emerged from these a few weeks later. The spinnings made by the larvae of *Gracillaria semifascia* Haw. were much in evidence in leaves of maple in a small strip of woodland at the far end of the golf course, but we were too late to find any of these cones containing larvae. The land there (St. Helens Common) is under the care of the National Trust.

Just to the north of the ruins of the old St. Helens Church by the edge of the sea there is a low broken cliff covered with trees and thick vegetation. We tried dusking here once or twice, but results were poor. The most interesting species taken was *Eilema griseola* Hb., which was quite common. At the top of the cliff we found clumps of *Genista tinctoria*, and the blackish mines of *Leucoptera walesella* Stt. in the leaves were particularly common. A small tin full of these which I kept produced about thirty imagines three weeks later.

Together with Mr. J. Lobb, who lives on the Island and is a keen entomologist, the doctor and I visited Alum Bay on the 13th. It was a long journey by omnibus, being at the opposite end of the Island. We made our way from the omnibus terminus up the slope to the top of the down near the Needles, collecting a number of larvae of *Epermenia daucella* Pey. in the leaves of wild carrot on the way. We wished to see how the colony of *Alucita spilodactyla* Curt. was progressing; also Dr. Macnicol had not previously taken this local insect. We found the plants of White Horebound rather more stunted than usual owing to the dry summer, but larvae and pupae were found at once on the plants in spite of their perfect camouflage colouring. A little later we found a clump where several empty pupa cases were visible. Having the bee-smoker with me, a few puffs of smoke were given and nearly a dozen moths immediately appeared from the base of the plants. The *Marrubium vulgare* grows right to the extreme edge of these high cliffs and it is a never-to-be-forgotten experience collecting this species here.

An interesting day was spent by the three of us again on a trip to Luccombe. We descended the Chine by the innumerable steps to the shore, and our main search this time was for the larvae of *Laspeyresia gemmiferana* Treits. which feeds on *Lathyrus sylvestris*—a plant which grows in extreme abundance hereabouts. Some years ago I discovered that the larvae feed between united leaves and not in the seedpods as so many of the books give. Although the feeding places were so much in evidence a search revealed that most of these were empty or contained a dead larva with a parasite cocoon nearby. After one of us had got bogged down and duly rescued from the treacherous "blue slipper" mud we sought some drier ground and by discarding the empty spinnings were able to get enough larvae to satisfy our wants. The large purplish blotches on the *Lathyrus* leaves caused by the mining larvae of *Leucoptera lathyrifoliella* Stt. were also plentiful, and some imagines of this small species were boxed. It is a matter of interest that soon after spinning up the larvae of *gemmiferana* pupate, whereas most of the species in this genus remain in the larval state in their cocoons until the spring. The brown pupae have a double ring of short bristles pointing posteriorly on each segment. It would be interesting to know of other species in this genus that have this characteristic, and exactly what is the purpose of this peculiarity.

Although there were some good clumps of Wild Madder (*Rubia perigrina*) growing on the low cliff at St. Helens, we failed to locate any *Mecyna asinalis* Hb. in the vicinity. However, we had better luck at St. Lawrence (near Ventnor) where we disturbed a pair of these local moths from some large clumps of the foodplant growing by the roadside on the way up to the top of the Undercliff.

We failed to find any larvae of *Nephopterix genistella* Dup. in webs on gorse either at St. Helens or at Gurnard, which is surprising, as this species is usually to be found in plenty at both these places. The scarcity of coastal species like *Agrotis ripae* and *Leucania littoralis* is also hard to explain.

REFERENCES.

- Fassnidge, W. 1929. *Trans. Ent. Soc. So. Eng.*, V., 41-60.
 Jeffery, H. G. 1928. *Proc. I.W. Nat. Hist. Soc.*, 584-595.
 Meyrick, E. 1928. *Revised Handbook of British Lepidoptera*.
 Morey, F. 1909. *Guide to Nat. Hist. of I.W.*

Some Additions to the Suffolk Lepidoptera

By ALASDAIR ASTON

In addition to species 1542 (1021A) *Pammene aurantiana* Staud. (*Ent. Rec.*, 70: 29) and to those species listed *Ent. Rec.*, 70: 306, I am able to give details of further moths new to Suffolk, bringing the county total up to 1560 species. The figure in brackets represents the placing of the moth in the Final Catalogue of the Lepidoptera of Suffolk, published as a memoir by the Suffolk Naturalists' Society in 1937.

- 1541 (82A) *Caradrina ambigua* Fab. First taken in Suffolk by Mr. P. J. Burton and recorded from Needham Market by Messrs. John and Geoffrey Burton on 26th May 1952. I was pleased to take several at Staverton on 30th August 1952, when collecting with Mr. Chipperfield and Messrs. John and Geoffrey Burton, who each obtained a series.
- 1554 (1397A) *Opostega crepusculella* Zell. I took a specimen at Stowmarket at light on 22nd August 1958, identified by Mr. Wakely. New to Suffolk.
- 1555 (1145A) *Blastobasis lignea* Walsm. When collecting at Aldeburgh with Mr. Chipperfield on 8th August 1959, I took a series of this species which was later confirmed by Mr. Wakely. The specimens were taken at the house of Mr. and Mrs. E. F. Crosby who allowed us to collect in their impressive grounds, where 101 species were observed that night. *B. lignea* is new to Suffolk, but may have existed there unobserved for some time.
- 1556 (1145B) *B. decolorella* Woll. One specimen only flew to light at Aldeburgh on 8th August 1959, at the same house on the same night as *lignea*. The specimen was very rubbed, and rather late for the first brood, which lasted in Dulwich till 24th July. Accordingly, Mr. Wakely sent the specimen to Mr. J. D. Bradley, who confirmed it as *decolorella*. This species has already been recorded from Essex by Mr. R. M. Mere, and it seems to be expanding northwards.
- 1558 (1395B) *Acrolepia assectella* Zell. I can find no exact record of this species in Suffolk, but Mr. E. A. Ellis stated that it had died out in Norfolk and Suffolk by 1951 (*Entomologist*, 84: 104). I caught a small specimen at Stowmarket at light on 10th August 1959, identified by Mr. Wakely and confirmed by Mr. Bradley.

- 1559 (1286B) *Coleophora fuscocuprella* H.S. New to Suffolk on 8th August 1959, when I took a specimen at Staverton. It was identified by Mr. Wakely.
- 1560 (1135A) *Blastodacna atra* Haw. The species recorded in 1937 as this one is really *B. atra* Meyr. on hawthorn. On 11th August 1959 I took a specimen at Stowmarket of *B. atra* Haw. which was identified by Mr. Wakely.

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The Early History of *Hyponomeuta irrorella* Hüb. in England

By S. C. S. BROWN, F.D.S., F.R.E.S.

Mr. S. Wakely (1), in his interesting note on the rediscovery of *Hyponomeuta irrorella* Hüb. asks if any reader can give any more information about this species. He also expresses the opinion that the majority, if not all, of the specimens in the old collections originated from the moths bred by W. Kirby of Wandsworth in and around the year 1856. There is evidence, however, from a study of the entomological literature, that *irrorella* was known to us some 50 years before this date. Haworth (2), in his *Prodromus*, published in 1802, states that he had seen it alive, but that nothing was known as to its life-history. At least one specimen was in the Aurelian Cabinet, which was in the possession of the third Aurelian Society, founded by Haworth. This Society came to an end in 1805. According to Stephens (3), there is another reference by Haworth in his *Lepidoptera Britannica* (4), concerning *irrorella*, but owing to the extreme rarity of this latter work of Haworth, and the difficulty in seeing a copy, I have not been able to verify this reference. Samouelle, in 1819, in his *Entomologists' Useful Compendium* (5), says that the species occurs in June, and that it is found at "Coombe". His only reference is Haworth (4). Stephens (3), in his *Systematic Catalogue*, published in 1829, called it the "Surrey Ermine" and quotes the two Haworth references. John Curtis has a plate in his *British Entomology* (6) figuring *Yponomeuta echiella* and *Y. pusiella*. This plate is dated July 1, 1832, and is numbered 412. The two pages of text accompanying it mentions eight species in the genus *Yponomeuta*. No. 4 is *irrorella* "Found in Surrey, but rare". James Rennie (7), 1832, in his *Conspectus*, says: "Not common. Surrey". In 1834 appeared volume IV of J. F. Stephens's *British Entomology* (8). He writes of *irrorella*: "Very rare; I have a pair which I found many years since at Coombe Wood in June, and have had others that were captured near Birch Wood: it appears to be a local species". As Stephens was born in 1792, the date when he took his first two specimens could hardly have been before 1810. His collection is in the British Museum (Nat. Hist.), and it would be interesting to see if these two specimens are still there. The first figure of this species in British Entomological literature appears to be the one by Wood in 1839 in his *Index Entomologicus* (9). His figure which is reduced in size, is in colour and is reasonably good. Wood, in the text, merely quotes Stephens (8). Humphreys and Westwood (10), 1845, in their *British Moths* have a coloured figure. In the text they say: "Taken in June at Birch and

Coombe Woods, but very rare". H. T. Stainton (11), in his *Entomologist's Companion* 1852, p. 50, says: *irrorellus*. "In chalky places very rare, appearing in July (middle)". In 1854 Stainton brought out his *Lepidoptera Tineina* (12). Under *irrorellus* he says: "A scarce species, appearing in July, among *Euonymus*; the larva gregarious when young, feeding on that plant in June". In 1859 appeared Stainton's (13) *Manual of Butterflies and Moths*, Vol. 2. On page 308 he writes: *irrorellus* "Larva on Spindle. June. Near Wandsworth". While attending the Eleventh Congress of British Entomologists at Oxford in July, I took the opportunity of visiting the Hope Department of Entomology, and examining the collections there. I am indebted to Professor G. C. Varley for kindly allowing me to do so. In the historic Dale Collection there are no *irrorella*. J. C. Dale does not appear to have ever possessed a specimen, for he has marked it as "wanting" in the catalogue of his collections. In his MS note-book, No. 64, under *irrorella* there is: "Mr. Tomkins, Birch Wood". This Tomkins could have been H. Tomkins or J. C. Tomkins of Russell Square, London; they both collected British Lepidoptera. Their names appear in the List of British Entomologists compiled by Stainton which appeared in the *Entomologist's Annual* for 1859. H. Tompkins, a London collector, was a correspondent of J. C. Dale, and wrote 26 letters to him between 1853 and 1863. These letters are preserved in the Hope Museum and it may be profitable to examine them. The difference in the spelling of the surname may be an error of Stainton's, and of Dale. In the Reference Collection in the Hope Department there are three specimens of *irrorella*. One is from the Spilsbury Collection and two from the Meldola Collection. They are without data. In the General Collections there are 10 specimens, including Hübner's type. Most of them are from the Spilsbury or Meldola Collections and all are without data. It might here be mentioned that neither of these collections came up for auction sale, but were bequeathed to the Hope Department. The Rev. F. H. Spilsbury died in 1878 and in 1915 the Department received the collection of Prof. Meldola. Who, then, was W. Kirby, the alleged captor and breeder of *irrorella*, of Wandsworth? Mr. P. B. M. Allan, in a foot-note to Mr. Wakely's paper, thinks that W. Kirby could not have been William Forsell Kirby, the entomological writer and worker at the Brit. Mus. (Nat. Hist.) as he would have been too young in 1856 to have been breeding microlepidoptera. He would have been 12 years old. However, in the obituary notice of William Forsell Kirby, in the *Entomologist's Monthly Magazine* for 1913, pp. 19-20, written apparently by the editor, one reads: "As early as 1856 we find him contributing to the *Entomologist's Weekly Intelligencer*". In Stainton's List of British Entomologists in the *Entomologist's Annual* (14) for 1856, there is only one Kirby, and this is William Kirby of South Street, Wandsworth. His name is marked as one who is willing to assist beginners with specimens or information. The name W. F. Kirby, with an address at Brighton, appears for the first time in the List in 1859. It would appear, therefore, that W. Kirby was a man of mature age in 1856 and could not have been W. F. Kirby. There does not seem any evidence that *irrorella* was ever taken at Wandsworth. In fact, it is an unlikely locality for a moth whose larva feeds on *Euonymus europaeus*.

REFERENCES

- (1) Wakely, S. 1959. *Entomologist's Record*, **71**: 61-63.
- (2) Haworth, A. H. 1802. *Prodromus lepidopterorum Britannicorum*, 35.
- (3) Stephens, J. F. 1829. *A Systematic Catalogue of British Insects* II, 203, No. 7271.
- (4) Haworth, A. H. 1803-1829 *Lepidoptera Britannica*. 512.
- (5) Samouelle, G. 1819. *Entomologist's Useful Compendium*, 399. No. 349
- (6) Curtis, J. 1824-39. *British Entomology*.
- (7) Rennie, James. 1832. *A Conspectus of the Butterflies and Moths found in Britain*. 198.
- (8) Stephens, J. F. 1834. *Illustrations of British Entomology*, IV. 242-43.
- (9) Wood, W. 1839. *Index Entomologicus* 186. Fig. 1282.
- (10) Humphreys & Westwood. 1845. *British Moths*, II, Pt. CX. 202. Fig. 21.
- (11) Stainton, H. T. 1852. *The Entomologist's Companion*. 50.
- (12) Stainton, H. T. 1854. *Lep. Tineina*. 60.
- (13) Stainton, H. T. 1859. *Manual of Butterflies and Moths*, II. 308.
- (14) *Entomologist's Annual* (The). 1855-74.

Lysandra coridon Poda ab. *syngrapha* Kef. a sex limited character

By Major A. E. COLLIER

Successful matings in August 1959 between a male heterozygote, son of a *syngrapha* female taken in Wiltshire in 1957, and two unrelated bred *syngrapha* females resulted in 1959 in two lots of 62 and 63 pupae.

From the first brood there emerged 31 typical males, 17 type females, and 14 *syngrapha* females, and from the second 32 typical males, 16 type females, and 15 *syngrapha* females.

All the males were identical in appearance, but from the results obtained and from our knowledge of the sex linked character of *syngrapha* it is reasonable to assume that in each case the males consisted of approximately 50% homozygotes and 50% heterozygotes and that as these were indistinguishable the character is sex limited.—3.xi.1959.

Notes on the Microlepidoptera

By H. C. HUGGINS, F.R.E.S.

Heterographis oblitella Zell. As is generally known, the large colony of this moth at Pitsea did not survive the winter of 1956/7; a few specimens were seen in different parts of the country in 1957; and I heard of no records in 1958.

I am therefore rather pleased to find that another immigration has taken place in 1959.

The first specimen known to me was taken at m.v. at Chiddingfold by Mr. R. M. Mere on the night of 8/9th August, a rather small, light male. On the night of 10/11th August, Lt. Col. W. B. L. Manley took another in his trap at Otford, Kent. On 17th August I found a light male on the wall of this house in front of my trap, and on the night of 5/6th September there was a large well-marked female in it.

On a date between 2nd and 19th September, Mr. Austin Richardson took one in a trap on St. Agnes, Isles of Scilly. This is the second

Scilly specimen to be recorded, as Mr. Mere and Mr. E. C. Pelham-Clinton took one at light on Tresco in July 1957.

Finally, at the South London field meeting held at Farningham, Kent, on 20th September, Mr. S. Wakely found one at rest on a flower of *Anthemis cotula* on the side of the road, on the way back to the station. This capture seems to be of especial interest, as it is the first time I have heard of the moth sitting on a flower. Although I must have seen hundreds at Pitsea in 1956, in every case the moth was sitting on the bare ground, and all that I flushed, resettled on the ground excepting one or two which settled on a dry stem of a dead plant. Two specimens I saw at Leigh on Sea in the same year were also on the ground, and one at Bowers Gifford, in a dry cart rut.

As will be remembered, in 1953 Mr. Fairclough took one in his garden at Leigh, Surrey; Mr. Rumsey one in Norfolk; and I one in the garden here, all at light. I have little doubt these represented an immigrant flight; in 1955 I took two more in the garden, and in 1956 Mr. Uffen and myself found the big colony at Pitsea. I am convinced that this colony was a result of the 1953 immigration, and that my two 1955 specimens were wanderers from it, as during 1956 I took over a score at my garden light, and Mr. D. More several at Hockley, always when the wind was blowing from the marshes.

So far, I have failed to discover an autumn colony here, but I am hoping, should the winter be favourable, to find one next year. It must be remembered, however, that the Pitsea colony grew up in highly artificial surroundings.

I am indebted to all the entomologists named for their information, and in each case the identification, where necessary, has been checked.

Aviemore, July 4th to 26th

By CLIFFORD CRAUFURD

This year my holiday in Aviemore extended to three weeks. Mr. F. A. Noble took me up on 4th July. Leaving Bishop's Stortford at 5.15 a.m., we called in Edinburgh to pick up Mr. Noble's sister, and arrived at Alt-na-Craig in time for dinner, being welcomed by Mr. and Mrs. Masurier. Mr. Masurier looks after entomologists with the knowledge of an expert, and is always willing to give advice and help. Mr. Noble left Aviemore with his sister on 18th July, and Mr. Odd of Pulborough spent my third week with me. He took me back on 26th July, and we reached my home at 6.15 p.m. I also received advice and assistance from Mr. Wightman, who spent the summer at Alt-na-Craig.

The insects seen were the usual ones recorded year after year during July. Of the butterflies *Erebia epiphron* Kn. was reported as nearly finished; *Coenonympha tullia* Mull. was still flying, and in the third week *Erebia aethiops* Esp. was emerging in good numbers. Mr. Noble captured *Satyrus semele* L. at Culbin Sands. *Argynnis selene* Schiff. was not yet over. On 25th July I took a female *Mesoacidalia charlotta* Haw. (*Argynnis aglaia* L.), on the Sluggan Pass, with a very light ground colour. I had hoped to catch some of the very dark females which occur in the district and also in the Sidlaw and Ochil hills. Some larval nests of *Aglais urticae* L. were seen, and at the end of the month the butterfly was flying freely. *Aricia agestis* Schiff. s.sp. *artaxerxes*

Fab. was still flying but was nearly over when we arrived. *Maniola jurtina* L., *Polyommatus icarus* Rott., and *Pieris napi* L. were seen.

At the melancholy thistles at dusk *Plusia chrysitis* L. and *P. pulchrina* Haw. were the commonest of this family. *P. bractea* Schiff. and *P. festucae* L. were to be captured in their usual numbers and *P. interrogationis* L. also came to the thistles and was often seen over the heather in the daytime.

Eurois occulta L., *Polia hepatica* Cl. (*tineta* Brahm.), *Diarsia festiva* Schiff., *Amathes baia* Schiff., *Diarsia brunnea* Schiff., and *Hadena thalassina* Hufn. were all seen at sugar, but *hepatica* was past its peak. *Triphaena comes* Hb. showed much variation, and several var. *curtisii* were taken. *Itama brunneata* Thun. was very common in the Einich valley, in the second week, and *Carsia paludata* Thun. was common, in the third week, on Granish moor and the slopes of Craigellachie. Only one *Anaplectoides prasina* Schiff. came to sugar, also one *Bombycia viminalis* Fab. and one *Celaena haworthii* Curt. In the last week, *Parastichtis suspecta* Hb. was common and showed much variation. *Xanthorhoe munitata* Hb. was netted at dusk and was fairly common.

Mr. Noble took *Comacla senex* Hb. near Loch Garten at light on 7th July, a new species for the district, and the first Footman recorded in the area.

One day, when up the Findhorn Valley, Mr. Noble, his sister and I saw the golden eagle soaring between the mountains for about twenty minutes, my first sight of the golden eagle after twelve years at Aviemore. We also visited the ospreys' nest in the Abernethy forest, near Loch Garten, and had a fine view of the birds. Mr. Odd and I saw them in the third week of my stay, and we were lucky enough to see the cock bird return to the nest with a large fish.

Random Notes

By CLIFFORD CRAUFURD

Hadena compta Schiff. (varied coronet): This species now appears to be well established in the Bishop's Stortford district, as thirteen came to the trap between 12th and 30th June. It is now commoner than *H. conspersa* Schiff., of which I saw only five. I also had four *compta* emerge from 1958 pupae, and I have saved all the sweet William flower heads this year, which have given me 24 pupae, a fair proportion of which should prove to be *compta*.

Leucania pallens L. (common wainscot): During the latter part of August this species visited the trap in ones and twos but between 31st August and 13th September I counted 667 specimens, the largest numbers coming on 6th September (125) and 7th September (130). Thereafter the numbers went back to normal. I shall be pleased to learn whether there was an immigration of *pallens* in the first week of September.

Phlogophora meticulosa L. (angle shades) came to the trap on an average of two per night until the night of 7/8th October. That night was foggy, and at 11 p.m. there were no moths in the trap, and no flies or other insects at the light, but when I went to take the trap into the house at 5 a.m. there were 60 angle shades on the sheet and

grass and another 57 in the trap when it was opened after breakfast. There were also 35 *Agrotis ipsilon* Hufn., 19 *Plusia gamma* L. and 5 *Peridroma porphyrea* Schf. I had been getting an average of 3 *gamma* and 1 *ipsilon* each night, but these were the first *porphyrea* this season. I believe these are all immigrants and so far as Bishop's Stortford is concerned, they must have flown in above the fog. On 8th October a friend here telephoned to know whether I would like a convolvulus hawk, and I at once went to receive the insect. It was a male in very fair condition, and had been found on some steps opposite one of the large standard lamps in the town.

On 17th September 1944 there was a very large immigration of *meticulosa*, and at the same time *H. convolvuli*, *P. porphyrea*, *P. gamma* and *Agrotis ipsilon* were in large numbers (*Ent. Rec.*, 57: 29-31).

I was visiting a local lucerne field on 12th September, and saw a few *Colias croceus* Fourc. flying. The first one that settled, a male, appeared to be damaged; but I caught it, and after further examination found that it was a symmetrical aberration, both of the hindwings on the underside being scaled in a peculiar manner. I visited the field several times in the next week, and saw about a dozen males, but no females.

I stayed at Bournemouth from 19th to 26th September and spent two afternoons at Ramnor, Parkhill and Pignall enclosures in the New Forest. I saw only one *atalanta* and one *megea*, but that is not surprising as the glades were dried up and only a few hawkweeds and devil's bit scabious were in bloom. On the cliffs on the Bournemouth front, however, there were good numbers of *atalanta*, several *croceus*, *io*, *urticae*, and *phlaeas* flying at the veronicas. I was very pleased to see *stellatarum* flying at the white tobacco plant blooms in the Bournemouth gardens. After returning to Bishop's Stortford I saw *stellatarum* again on four occasions at the petunias in the gardens. *Atalanta* and *c-album* have been visiting the rotten apples and pears on the compost heap, the former in good numbers, sometimes nearly a dozen at one time.

On 2nd August Mr. Noble called for me and took me out to Tudenham, where we had a very enjoyable late afternoon and evening. He recorded 56 species at light, sugar, and captured in flight. Some of the more interesting species to me at sugar were *Procus literosa* Haw. (several), the first I had ever seen, *Agrotis vestigialis* Hufn. (1), *Hadena suasa* Schiff. (several), *Amathes stigmatica* Hb. (1), *Eilema complana* L. (several), *E. deplana* Esp., with vars. *ochrea* and *unicolor*. Mr. Noble also took two or three *Anepia irregularis* Hufn. at light.

Collecting Notes

Ucullia verbasci L. is usually rather a 'chancy' insect; by this we mean that if one finds larvae in plenty on a particular colony of mulleins, or on the figworts growing within a few paces of each other on a certain stretch of river-bank, it is most unlikely—at least that has been our experience—to find the species there again next year. Does this suggest that, since a goodly percentage of these larvae are usually ichneumoned, the predators 'hang around' and that the ♀♀ *verbasci* somehow or other get to know this and consequently fly elsewhere?

Or can the botanists tell us that a large caterpillar feeding heartily on a herbaceous plant lowers that plant's vitality, so that next year it will not be looked upon favourably by a female moth? There must be a reason for this 'chanciness' in meeting with *C. verbasci* in spots which we 'work' every year. Can anyone make suggestions?

With some species the same tree or bush or clump of plants is patronised by the same species year after year. For instance, a certain small aspen less than two feet high, growing in the bottom of a dry ditch, will always support two or three *N. ziczac* larvae; a larger one will invariably contain one or two *P. palpina*; yet another is rarely searched without yielding *C. curtula*; certain patches of *Galium verum* can be relied upon to harbour at least a brace of *D. porcellus*. There are isolated osiers in certain ditches from which one can be sure of collecting *S. ocellata* every year; oak trees that are never without *A. ridens*, and so on. Yet a stretch of river, along one bank of which there are figworts every few yards, will be devoid of *C. verbasci* for four or five years in succession; and then every plant will be tenanted by these larvae. Why is this?

I have no intention of reopening the old controversy about *Cucullia verbasci* and *C. scrophulariae* but I once saw, *in situ* on a plant of figwort, a full-grown larva of a *Cucullia* species which I am certain was not *verbasci*. It was like this. In my larva-cages at home I had twelve full-grown larvae of *C. verbasci* which I had collected from figwort on the bank of a neighbouring stream. When I was beginning to think about inserting pupating-troughs in the cages my local natural history society had a field day in Epping Forest. We assembled to eat our sandwiches and show the morning's captures on an open space near the Wake Arms. After lunch I accompanied a lady of our party, a beginner in entomology, to look for sundew in a small boggy spot on the left of the road which goes down the hill from the Wake Arms to the Volunteer Inn at Upshire. As we walked about this spot, looking for marsh plants, I caught sight of a single well-grown plant of figwort a few yards away and suggested to my companion that she should search it for larvae of *C. verbasci*. She had hardly begun to search when she called out "Here's one!" And there sure enough was a larva of a *Cucullia* but certainly not *verbasci*. For a fortnight I had been watching the habits of my *verbasci* at home every day and this larva was unmistakably different. My companion proceeded to box it, proud of her find. But it proved to be ichneumonid and I was unable to procure the corpse for blowing. I read Buckler's remarks until my head went round, but "nohow could I fix it".

Verbascum nigrum, the black mullein on which *C. lychnitis* feeds, may be a common plant in some places: Skene says that it is indigenous only in southern England and is an 'escape' elsewhere: and certainly we have never found it other than as an 'occasional'. It must be local everywhere. In an area of some 95 square miles in one of the Home Counties, worked for more than twenty years by some twenty botanists,, *V. nigrum* is recorded in the local flora as "Occasional only". The one colony of it which we know is in a small chalk-pit beside a lane that runs between arable fields far removed from dwell-

lings. Here the plant flourishes year after year; but although the leaves, and once or twice the seeds of one plant or another, have shown signs of toothmarks, nary a larva of *Cucullia lychnitis* have we found thereon.

In spite of these annual failures the conscientious field worker should make a point of searching carefully such little isolated colonies of *V. nigrum* every year, year after year. It may well be that *C. lychnitis* is absent from his district; but that should not deter him. We will be so bold as to say that in every population of every species of Lepidoptera there are one or two 'adventurers' who strike off on their own and fly many miles in their search of (if they are males) fresh blood with which to mate, or, if they are gravid females, a fresh and likely habitat in which to found a colony. You never can tell. The time to search for larvae of *C. lychnitis* is from 21st July to 14th August, and in confinement they will eat garden mulleins.

Notes and Observations

EUPLAGIA QUADRI-PUNCTARIA PODA.—The note in the July-August issue on the subject of *Euplagia quadripunctaria* Poda (antea, 181) in its haunts on the South Devon coast, westwards from the Exe estuary, was of great interest to me because all the specimens of this moth which I possess (fourteen) are from east of the Exe, or bred from an Exmouth female, from 1931 to 1933. The moth was then common and widespread in Exmouth and continued to be so at any rate until 1940.

The *Record* note was discussed a few days ago at a meeting of Devon entomologists, and the general conclusion arrived at was that the Jersey tiger, while still occurring in Exmouth, is less common there than formerly and is more restricted in its habitat. It has been noticed in the past few years in Exeter, at Sidmouth, Newton Poppleford, and Ottery St. Mary, and as far east as Uplyme right on the Dorset border, but nowhere in any abundance, and there is no doubt that the bulk of Devon *quadripunctaria* are west of the Exe. The remaining specimen in my series was taken here in 1951, and I saw one here in each of the years 1952, 1953 and 1954, but none since. This place is nearly 25 miles from the sea at Sidmouth, and is by some twelve miles the most northerly locality from which the Jersey tiger has been recorded.—F. H. LYON, Sampford Peverell, Tiverton. 16.x.1959

MIGRANT MOTHS AT WESTON-SUPER-MARE.—It may perhaps be of interest to mention the following occurrences at Weston-super-Mare of a few of the less common migrant moths during this year:—

Leucania albipuncta Fabr. (2) October 6 and October 8.

Laphygma exigua Hubn. (2) July 12 and August 27. (A third specimen was taken by me in the Sychnant Pass, North Wales, on July 8).

Heliothis peltigera Schiff. (3) July 18, September 14, and October 1.

Nycterosea obstipata Fabr. (6) Three specimens taken on July 22, August 1 and September 30, and three others seen during these months.

Margaronia unionalis Hubn. (2) October 14 and 15.

All the above were taken at light.—C. S. H. BLATHWAYT, Amalfi, 27 South Road, Weston-super-Mare. 29.x.1959.

Field Work

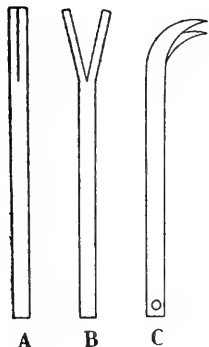
Here are some more notes on field work for beginners: this time on moss searching and sexing the pupae which one disinters.

Moss searching is an item of field work that goes usually hand in hand with pupa-digging, which was dealt with in this journal in November 1957, but whereas pupa-digging is customarily the subject of a special expedition, one can indulge in moss-searching whenever one is in the field, whether it be spring, summer, autumn or winter. Provided, of course, that one has taken the precaution to put a moss-pick in one's pocket or haversack before starting. And what is a moss-pick? It is one of the most useful tools in the field worker's equipment. For searching moss on trunks and gate-posts (often productive) and for grubbing at the roots of trees there is nothing like a moss-pick. Unfortunately, it is a tool that one cannot buy and, therefore, it has to be made for one by a blacksmith or friendly garage man. The accompanying diagram shows its evolution, and here is a description of it which was given in this journal some years ago (*Ent. Rec.*, 63: 284):—

"The moss-pick is a simple tool which can be made in half an hour by any blacksmith or motor mechanic out of a piece of $\frac{5}{16}$ " diameter round iron rod 8" long. With a hack-saw make a slit, $1\frac{1}{4}$ " long, at one end, as shown in the accompanying diagram at *a*; then force the two sides of the slit apart until their extremities are exactly half an inch wide, as shown at *b*. Put the prongs in a vice and bend them, as at *c*. Then file the prongs as shown. The distance between the points of the prongs, when the tool is finished, should be *exactly* half an inch.

"It is a mistake to file the prongs sharp. If you do so, they will (1) perforate or tear your pocket or haversack, (2) penetrate the bark beneath the moss and keep on getting caught up, and (3) perforate any cocoon they encounter and kill the pupa within.

Therefore, let the extremities of the prongs be quite blunt, in fact rounded a little. (In the accompanying diagram they are much too sharp.) It is a good plan to drill a hole through the extremity of the handle as shown at *c*, so that you can add a loop of *white* string. Then if you drop the pick in a bed of nettles or among that little clump of bramble at the foot of the tree, you will be able to find it again without loss of temper".

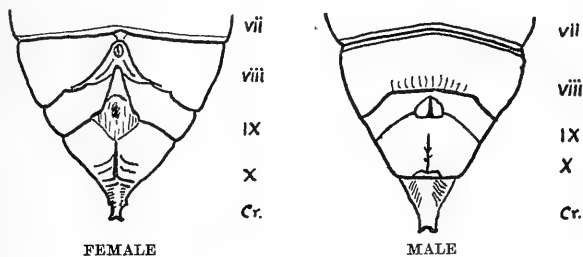


This useful tool is really invaluable when one takes the field at any time of the year. A thick growth of moss on the trunk of a tree is usually productive of something in the moth line, whether on the spreading roots of an old oak or on the trunk five feet up; such sites are favoured by many species. And if you are a coleopterist you will find the moss-pick as valuable to you as it is to the lepidopterist. Even in dense woodlands, under moss on the trunks of oaks only a century old, one rarely fails to find a pupa or two. Incidentally, this seems to be the surest way of obtaining the pupae of *Plagiodis dolabraria*, the Scorched Wing.

With regard to the sexes of the pupae which one's moss-pick disinters, it is important, even before taking the implement in hand, to be able to distinguish the sexes of the pupae found; for the females may be required for assembling, and if one can determine the sexes they can be kept in separate boxes or cages. Where sexual dimorphism is not obvious, which is the case with many of the species unearthed by moss-pick or pupa-digger, the vestiges of the ancestral genitalia afford the only sure guide. Therefore, if the tyro is uncertain about this matter let him take a pupa in hand, preferably a large one such as a hawk-moth, and hold it head upwards with the ventral surface facing him.

Two somites ("segments") are concerned in this determination of sex, the 8th abdominal and the 9th abdominal. Count from the posterior end. One cannot mistake the 10th abdominal somite, for this bears the cremaster, and even when there is no cremaster it is the *last* somite. A lens will show that it bears a small depression like a slit—the ancestral (pupal) anus. This slit is usually surrounded by folds or wrinkles and frequently it is on the summit of a little mound.

Now turn to the next somite, the 9th. Is its posterior margin a more or less regular curved line which runs from side to side of the pupa as you are viewing it? Or is it invaded by a wedge-shaped extension of the 10th somite which runs forward (upwards as you are holding the pupa) nearly across the 9th to its anterior margin, perhaps right across it and even invades the 8th? If the former is the case you may mutter "male"; if the latter, "female". For the first thing which arrests



attention if the pupa is a female is this wedge-shaped extension of the 10th somite into the 9th and, sometimes, into the 8th. The anterior margin of the 9th itself is also extended, very often, into the 8th. These are the first distinctions between male and female which one notices. Search must now be made for the ancestral pupal genital openings.

Still examining, with a lens, the 9th somite, one can see, exactly in the middle line, if the pupa is a male, a tiny slit-like mark flanked by two rounded lips. Sometimes the mark is quite a deep pit. This was once the external orifice of the seminal duct (*vas deferens*). If, on the other hand, the pupa is a female the orifice will still be there, but it will mark the ancestral opening of the common oviduct, and it may not be at all obvious. Therefore, turn the lens on to the 8th somite. (By the way, if in any doubt as to the identity of the 8th somite, remember that it is this somite which bears the last pair of (aborted) spiracles).

If the pupa is a female, one can see quite distinctly the mark of an orifice on the sternum of this somite, in the middle line. This was the opening of the *bursa copulatrix*. It may be quite distinct from the orifice on the 9th somite (oviduct), or the two openings may be so close together as to be almost confluent—which will account for any difficulty in spotting the orifice of the oviduct when examining somite 9. But a scar—it is usually quite a distinct slit-like mark, flanked by quite prominent lips—in the middle line on the sternum of the 8th abdominal somite can only denote the former opening of the *bursa copulatrix* and, therefore, shows beyond all doubt that the insect is a female.

Variation in all the above mentioned points is great; but almost always one is able to see, in female pupae, the wedge-shaped extension of the 10th somite forwards into the 9th and the mark denoting the opening of the bursa on the 8th. Neither of these features is present in the male.

The Hydradephaga (Col) of the Reading District of Berkshire

By ARTHUR PRICE

A study has been made of water beetles around Reading and in Carmarthenshire for some three years. During this period I have collected intensively all the year round. Active beetles have been found in all months, but most species are only found in good numbers during the two peak periods, May/June and August/September.

In a rapidly expanding area such as Reading, many productive habitats are in danger. Indeed, some are even now in the process of being "developed". Two such areas, in particular emphasise this threat to our aquatic fauna:

COLMANS MOOR: This locality, comprising a series of mossy ponds and swamps, has produced five of the seven species of *Ilybius*, including *I. subaeneus* Er. It has also yielded *Hydaticus seminiger* DeG. and *Rantus graphii* Gyll. Part of this area is now being cleared and levelled for building.

COW LANE, READING: In a slow flowing ditch, well covered with *Riccia fluitans* and *Lemna trisulca*, I have captured four species of *Dytiscus*, viz., *semisulcatus* Mull., *marginalis* L., *circumcinctus* Ahrens and *circumflexus* F. This land is now being developed for recreational and industrial purposes. Fortunately, a drift of *D. circumcinctus* to a safer, adjacent habitat has been detected.

Another habitat of great interest is an acid pond at Wokefield Common, which invariably dries up in dry summers. This pond supports a well established population of *Hygrotus decoratus* Gyll. and seven species of *Hydroporus*, including *H. neglectus* Schaum.

In the following records, *Common* is taken to mean widespread and *abundant* to mean in good numbers. The number following *Locality* indicates the number of localities in which the species has been recorded.

LIST 1957-9

SPECIES	MAIN LOCALITY	NO. OF L.	HABITAT	NUMBERS
HALIPLIDAE				
<i>Brychius elevatus</i> Pz.	Common		Fast flowing water	Abundant
<i>Peltodytes caesus</i> Duft.	Burghfield	5	Ponds and gravel pits	Scarce
<i>Halipus obliquus</i> F.	Tilehurst	1	Detritus pond	1 only
<i>H. confinis</i> Steph.	Coleman's Moor	2	Gravel pits	Scarce
<i>H. fulvus</i> Fab.	Wokefield Common	1	Detritus pond	1 only
<i>H. laminatus</i> Schal.	Tilehurst	1	Pond	1 only
<i>H. flavicollis</i> Sturm.	Burghfield	4	Ponds and lakes	Abundant
<i>H. immaculatus</i> Gerh.	Cow Lane	1	Ditch	Fairly abundant
<i>H. wehnckei</i> Gerh.	Tilehurst	1	Detritus pond	Scarce
<i>H. ruficollis</i> DeG.	Common		and	Abundant
<i>H. fluvialis</i> Aube	River Thames	3	Running water	Scarce
<i>H. lineatocollis</i> Marsh.	Common		and	Abundant
HYGROBIIDAE				
<i>Hygrobia hermanni</i> Lat.	Sulham Ponds	3	Detritus ponds	Scarce
DYTISCIDAE + Noterinae				
<i>Noterus clavicornis</i> Herbst.	Common		and	Abundant
DYTISCINAE				
Hydropoorini				
<i>Bidessus geminus</i> F.	Collier's Claypit	5	Grassy edges of ponds	Scarce
<i>Hyphydrus ovatus</i> L.	Common		and	Abundant
<i>Hygrotus versicolor</i> Schal.	Thames	2	Hot water effluent	Scarce
<i>H. decoratus</i> Gyll.	Wokefield	1	Acid pond	Scarce
<i>H. inaequalis</i> F.	Common		and	Abundant
<i>Coelambus impresso-punctatus</i> Schal.	Tilehurst and Burghfield	3	Ponds and gravel pits	Scarce
<i>Deronectes latus</i> Steph.	Tidmarsh Mill	1	Mill tail race	1 only
<i>D. 12-pustulatus</i> Ol.	Sulham	2	Sul. stream	Scarce
<i>D. elegans</i> F.	Common		Running water	Abundant
<i>Graptodytes pictus</i> F.	Collier's Claypit	5	Ponds	Scarce
<i>Hydroporus dorsalis</i> F.	Wokefield	2	Acid Pond	Scarce
<i>H. lineatus</i> F.	Loddon Bridge	1	Ponds	10 only
<i>H. memnonius</i> Nic.	Wokefield	3	Acid Ponds	10 only
<i>H. neglectus</i> Schau.	Wokefield and Queensmere	2	Acid ponds	Scarce
<i>H. angustatus</i> Sturm.	Wokefield	3	Acid ponds	Scarce
<i>H. palustris</i> L.	Common		and	Abundant
<i>H. tessellatus</i> Drap.	Wokefield	3	Acid ponds	6 only
<i>H. nigrata</i> F.	Wellington College	1	Peaty pools	Scarce
<i>H. tristis</i> Payk.	Wokefield	1	Acid pond	Scarce
<i>H. erythrocephalus</i> L.	Common		and	Abundant
<i>H. umbrosus</i> Gyll.	Wokefield	2	Acid pond	Scarce
<i>H. gyllenhalii</i> Schiödte	Queensmere	3	Acid pond	Abundant
<i>H. pubescens</i> Gyll.	Wokefield	1	Acid pond	Abundant
<i>H. planus</i> F.	Common		and	Abundant
Lacophilini				
<i>Laccophilus minutus</i> L.	Common		and	Abundant
<i>L. hyalinus</i> DeG.	Caversham laundry	4	Flowing ditch	Abundant

Colymbetini

<i>Agabus didymus</i> Ol.	Sulham	3	Sul. stream	Scarce
<i>A. nebulosus</i> Forst.	Sulham Woods	5	Ponds	Scarce
<i>A. sturmi</i> Gyll	Common		and fairly	Abundant
<i>A. chalconatus</i> Pz.	Wokefield	3	Mossy ponds	Abundant
<i>A. bipustulatus</i> L.	Common		and	Abundant
<i>A. affinis</i> Paykull	Queensmere and Heath Pond	2	Acid ponds	12 only
<i>A. paludosus</i> F.	Sulham	3	Sul. stream	9 only
<i>A. labiatus</i> Brahm.	Wokefield	1	Acid pond	Scarce
				Fairly abundant
<i>Platambus maculatus</i> L.	Common		Running water	Abundant
<i>Ilybius fenestratus</i> F.	Caversham Park	5	Lake	Abundant
<i>I. fuliginosus</i> F.	Common		and	Abundant
<i>I. ater</i> DeG.	Coleman's Moor	9	Ponds and ditches	Abundant
<i>I. subaeneus</i> Er.	Coleman's Moor	1	Mossy Pond	1 only
<i>I. obscurus</i> Marsh	Coleman's Moor	4	Ponds and ditches	Abundant
<i>I. guttiger</i> Gyll.	Queensmere	1	Carex swamp	12 only
<i>I. aeneascens</i> Th.	Kingsmere	1	Sphagnum swamp	Abundant
				in June
<i>Copelatus agilis</i> F.	Tilehurst Potteries	6	Detritus pond	Fairly abundant
<i>Rantus graffi</i> Gyll.	Coleman's Moor	1	Mossy pond	2 only
<i>R. exsoletus</i> Forst.	Padworth	8	Oval pond	Scarce
<i>R. pulverosus</i> Steph.	Common		and fairly	Abundant
<i>Colymbetes fuscus</i> L.	Common		and	Abundant

Dytiscini

<i>Dytiscus semisulcatus</i> Mull.	Sulham	3	Ponds	Scarce
<i>D. marginalis</i> L.	Common		and fairly	Abundant
<i>D. circumcinctus</i> Ahr.	Thames side	3	Ditch in meadow	Small colony
<i>D. circumflexus</i> F.	Scour's Lane	5	Ponds and ditches	Scarce
<i>Hydaticus seminiger</i> DeG.	Burghfield	3	Gravel pit	Small colony
<i>Acilus sulcatus</i> L.	Whiteknights Park	5	Ponds	Scarce

GYRINIDAE

<i>Gyrinus urinator</i> Ill.	Burghfield Bridge	1	Small stream	2 ♂♂ only
<i>G. natator</i> L.	Common		and	Abundant
<i>G. marinus</i> Gyll.	Caversham Park	1	Artificial lake	1 only
<i>Oretochilus villosus</i> Mull.	Sulham	1	Sul. stream	2 only

The larva of *Oretochilus* is fairly widespread, but the adult is harder to find, being nocturnal in habit.

I have made several trips to the Wellington College area in search of *Ooelambus novemlineatus* Steph. but with no success. I understand that all the lakes in this region were drained during the war, and possibly the beetle has not survived.

Thanks are due to Mr. J. Balfour-Browne of the British Museum for his great help in the identification of the specimens.

BIBLIOGRAPHY

- Hydradephaga Key. F. Balfour-Browne. Ent. Soc. of London.
British Water-beetles, I and II. F. Balfour-Browne. Ray Society.
Handbook of British Beetles. N. Joy. Witherby.

Notes and Observations

COLIAS CROCEUS FOURCROY. IN S.W. SCOTLAND.—I was touring in Scotland during the first half of September, and on my southward return journey I camped for three days on the eastern shore of the peninsula between Stranraer and Drummole in Wigtownshire.

During the afternoon of 14th September I spotted a male *C. croceus* flying strongly on a westerly course from the seaward side (Luce Bay) of the peninsula. Although this particular specimen was not intercepted its general line of flight led me to a nearby stubble field sparsely grown with clover. Here further males appeared intermittently and I took three within the hour.

The next day I investigated the same field, taking four more males and discarding three others as too worn to be retained. No females were seen.

It occurred to me that, if *C. croceus* had penetrated as far to the north and west as Stranraer, there was the likelihood of greater abundance in the south of England, with the possibility of ab. *helice* and *C. hyale* L. in addition.

I arrived back home in Brockenhurst on 18th September and on the 19th I worked an area near Milford-on-Sea, taking one male and seeing three others. On the 20th I took one fresh female in a clover field 4 miles south of Blandford, Dorset, but saw no other *croceus* at all. On 22nd September I visited the same clover fields and saw one male only.

On the 23rd I tried an area near Beaulieu, Hants, and took three males, two of them in a cabbage field and the third by a hedgerow.

On the 28th I tried the clover fields near Blandford again but saw nothing. In the afternoon I moved to Hod Hill, Dorset, and saw only one male in a field of mixed mustard and cabbage plant. Finally on the 30th I took one more female in a sheltered clearing bordering some pasture fields.

I am puzzled by the comparative scarcity of *C. croceus* in the more favourable and extensive areas of the south of England, in contrast with the unexpected local abundance in the south-west of Scotland, even though only males were seen in this latter country. Of ab. *helice* or *C. hyale* there was no sign.

I have not received any reports of this species from other parts of the country, particularly in regard to the eastern and south-eastern sectors. However, it seems clear to me that their presence in Wigtownshire was no indication of a general abundance in the more favoured southern regions of the British Isles.

I will be interested to hear of reports from other collectors on this point.—Group Captain L. W. BURGESS, "Knoleforth", North Weirs, Brockenhurst, Hants. 23.x.1959.

BLASTOBASIS LIGNEA WALSM. IN SOUTH-WEST SURREY.—This species is spreading: I was pleased, but not altogether surprised, to take a specimen in the m.v. trap in my garden here on the night of 8th August 1959.—ROBIN M. MERE, Mill House, Chiddingfold, Surrey. 10.xi.1959.

A SECOND BROOD IMAGO OF *APATURA IRIS* L.—Readers may be interested by the fact that I have, without forcing, bred out in the same season a female from ova taken in Northamptonshire this year. The dates are as follows:—Ova 19th July, pupa 3rd October, imago 21st October. I also have a larva after the fourth moult, about 28 mm. long, which presumably will proceed in a like manner if only I can provide it with fresh sawfly during this late autumn period.—M. H. EDMONDS, "Gaveston", 938 Warwick Road, Solihull, Warwickshire. 1.xi.1959.

M.V. TRAPS.—A few days after I had sent my notes on m.v. traps to the Editor in June, I was beaten by the number of moths coming to the trap. On the nights of 24th to 29th June, and 9th to 14th August, I certainly had nearly 1000 each night, and as about 500 insects take up a very long time to box, count and record, I had to give up the counting of individuals of each species during those periods. I have an acre of garden to attend to so only the total numbers were counted. On 26th June there were 92 different species around and in the trap; this was the largest number. Mr. Todd mentions 2000 and 9000 moths in one night, but I have never experienced such numbers as my trap is not far from the wall of the house and there are a large number of trees fairly close at hand. I was at Aviemore during July and so missed the moths coming during the peak period of the year.

I am pleased to learn from the Rev. J. H. Vine Hall's notes that probably only professional entomologists are using any lethal chemical. I presume this is at research stations such as Rothamstead. The idea that common insects like *pronuba* or *monoglypha* can be spared does not appeal to me; we can spare no insects, however common, and if the present chemical spraying is long continued unchecked, there will be no need for research, owing to lack of subjects. I thank Mr. Todd and the Rev. J. H. Vine Hall for their replies.—CLIFFORD CRAUFURD, Denny, Galloway Road, Bishop's Stortford, Herts. 28.x.1959.

A WEEK ON LOHCARRON.—My wife and I spent the first week of September at Lochcarron on the northern shore of the similarly named loch. We had been for ten days at Aviemore (as to the collecting there, I can add nothing to Mr. L. E. Savage's report in the October *Record* (antea, p. 230) and to us Lochcarron was primarily a headquarters for the wonderful drive over the mountains to Applecross (the "Pass of the Cattle"). Entomology was not to be neglected, however, and as we had no light apparatus, and found no suitable ground for sugaring (anyhow, the hot dry weather was unfavourable) we spent a good deal of time beating and searching for larvae on the willows along the road to Loch Kishorn, which was most beautiful ground for collecting. Below the road runs a stream with a four-word Gaelic name: beyond this to the north rises a steep mountain massif on which peregrine falcons and ravens could be watched through our binoculars as a change from beating and stooping over bushes; to our disappointment we saw no eagles.

Larvae of *Hydriomena ruberata* Freyer were beaten freely from the willows which harboured no other geometrid larvae except *Cabera exanthemata* Scop. in abundance. *Apatele menyanthidis* View. larvae were found in one area only and mainly in low bushes down the hill

towards the stream. *Apatele rumicis* L. bore their kinsmen company. Larvae of *Clostera pigra* Hufn. we found more sparingly: they pupated almost at once, and we should no doubt have got more (and also of *A. menyanthidis*) a week earlier. *Ceramica pisi* L. were common on both bracken and sallow, but, of about half a dozen I kept, all but one died. *Cerura furcula* Cl. and *Notodonta ziczac* L. were, as might be expected, also present.

As we had brought with us from the Aviemore district, larvae of *Pheosia tremula* Cl. and *Tethea* or Schiff., and from Glen Tromie, near Kingussie, a number of *Hydriomena impluviata* Schiff., and the bulk of the caterpillars taken pupated successfully, I look forward to summer emergences in 1960 with more pleasure than I have been able to do for some years past.—F. H. LYON, Sampford Peverell, Tiverton, Devon. 16.x.1959.

A VARIETY OF *MANIOLA JURTINA* L. IN SURREY.—On 15th July, at Guildford, I was fortunate enough to take an unusual variety of *Maniola jurtina* L. The specimen, a female, had all the orange markings replaced by pure white, while the normally fuscous brown ground colour was affected also to be of a leaden shade. The specimen was in good condition and could not be confused with the bleached specimens which appear from time to time.—E. E. JOHNSON, Highfield House, Portsmouth Road, Guildford. 27.x.1959.

MACROGLOSSUM STELLATARUM L. IN BUCKINGHAMSHIRE.—*Macroglossum stellatarum* L. is always worth recording, and the following dates may be of interest. On 11th October 1959 I took two perfect specimens, one at rest on a window, and the other hovering over some red dahlias. The following day I saw a further specimen visiting the dahlia flowers. The weather on both occasions was rather warm but overcast.—JOHN F. REID, Roxburgh House, Great Brickhill, Bletchley, Bucks. 28.x.1959.

SOME WATER BEETLE RECORDS.—Mr. C. M. H. Harrison reported the capture of *Laccornis oblongus* De G. in a north Hereford carex swamp on 14th August 1959 and of *Graphoderus cinereus* Sturm (1♂) taken in Fleet Pond on 21st June 1959. *Agabus labiatus* Brahm was extremely abundant in Sphagnum pools at Silchester.—ARTHUR PRICE, 47 Lorne Street, Reading, Berks. 30.x.1959.

Current Literature

OPUSCULA ENTOMOLOGICA 24: 1-152. Lund. 1959.

The papers in English include one by Bo Tjeder dealing with the Pediciini (Dipt., Tipulidae) giving the distribution in Sweden and brief ecological data. Genitalia figures are included for *Dicranota robusta* Lundstr., *Ula crassicauda* Agrell, *Ula sylvatica* Mg., and *Ula bolitophila* Lw. Another by Paul Freeman is a report on Chironomidae from the Azores and Madeira of the Lund University Expedition of 1957 to these islands. Micro-lepidopterists will be grateful for the genitalia figures and accompanying notes by Niels L. Wolff relating to *Scythris cicadella* Zell. and *S. potentillae* Zell. types in the British Museum collection.

In German, a further portion of Max Fischer's study of the European species of the genus *Opius* (Hym., Braconidae) is among the papers on

hymenoptera and amongst the articles for the coleopterist is a paper that includes keys and figures for the family Clambidae by S. Endrödy-Younga.
L. P.

STUDIES ON SCANDINAVIAN EPHYDRIDAE (DIPTERA BRACHYCERA).
OPUSCULA ENTOMOLOGICA SUPPLEMENT 15. LUND. 1959. BY
RICHARD G. SON DAHL.

This is an ecological study of this family of flies in 161 pages with 7 pages of references and 55 of figures, maps and photographs. It is written in English. The author points out that the systematics of the genus *Hydrellia* require revision and although he frequently refers to *Hydrellia griseola* Fall., he does not deal with this species in the same manner as the 88 of the other genera. Of these species 65 are also known in Britain but the British fauna appears to be richer, with 40 non Scandinavian species in addition to 20 more species of *Hydrellia*.

The area and major habitats investigated are described and illustrated with photographs. A few of the ecological terms used are defined. The ecological factors are considered and the author discusses his experiments, illustrating with diagrams and photographs of his apparatus. The systematic list of the species is given with notes on literature, taxonomy, ecology, biology and world geographical distribution. The captures of each species in Scandinavia are listed with dates and collector's name.

The ecological notes are of particular interest to collectors as well as ecologists. The description of courtship habits are a pleasant and instructive introduction to this aspect of behaviour in the family. Quite an innovation is one of the many valuable figures showing the proportion of time spent by various species during the day at their main activities—feeding, cleaning, walking, courting, etc.

Two new species are described—*Scatella lindbergi* taken on maritime high beach in Finland, Norway and Sweden and *Discocerina* (*Ditrichophora*) *sia* found on dune heath in Norway. These serve to emphasise the author's ability in determination and one is, therefore, more regretful that he did not tackle the species of *Hydrellia*. Séguéy has stated that *Hydrellia griseola* mines plants of 15 genera, and Dr. B. R. Laurence has recorded the adult fly's habits in feeding on insects trapped in the surface film on pools, etc., of water. Hering has described the leaf mining habits of others of the genus. It seems that the genus would prove worthy of considerable attention.

There can be no doubt that this treatise following several others dealing with Scandinavian diptera, will be welcomed by British dipterists. The latter can but envy the justified comment by the author that Finland has had its diptera fauna most thoroughly investigated of all European countries. The study shows once again that the work of taxonomists opens up most interesting fields of exploration in habits, etc. With our admiration for the quality of the production of this work comes a regret that an index is not provided. We now hope for a revision of the British species so that comparative studies can be made in this country on the habits and ecology of the Ephydridae.

L. P.

Land and Water Bugs of the British Isles, by T. R. E. Southwood and Dennis Leston (Warne, 30/-). It is certainly time that a good popular work on the subject of the Heteroptera was made available to the public, for the insects which form the subject matter concern not only entomologists but horticulturalists and farmers especially, and to a lesser degree medical and research workers. It is a worthy addition to the Wayside and Woodland series, and will be especially useful to nature lovers in general who have long regretted the absence of a readily accessible means for identifying the bugs noted during their rambles. To this wide variety of readers, one might well add the professional entomologist, for although more highly specialized works will be available to them, this book will provide a means for quick reference.

The book consists of 436 + ix pp. with 62 plates, 32 of which are beautiful drawings in colour made by the late H. D. Swain from life; the remainder consist of equally beautiful black and white drawings by Mr. and Mrs. Entwistle, and there are many text figures by the authors.

The authors are to be congratulated on the broad outlook of their work, which is suitable for such a wide cross section of readers. Wherever possible, simple features have been used for the differentiation of species, and anatomic details requiring the use of a microscope are only invoked when absolutely necessary. The keys are such that genera and species may be run down with the aid of a good pocket lens (say $\times 8$ or $\times 10$) in almost all cases, and the use of a dissecting microscope would appear to be necessary only to the serious student.

The authors have had the courage to refuse to pander to the regrettably current mental laziness which prefers popular to scientific names, and they have classified under the scientific names, adding the popular name where one exists, and they make no attempt to manufacture popular names to fill the gaps. Generally speaking, reliance is placed in the figures for superficial description, but, where necessary, further details are added: the paragraph devoted to each species gives distribution, foodplant, and life cycle, to which are added notes on stridulation and chromosome numbers when these are known, this last detail being an innovation where a work of this description is concerned. When a feature is described in detail elsewhere a note reference is added in the text referring to the source, which is given at the end of each chapter under the heading "Literature cited". Thus the popular work has its link with the more detailed scientific papers, many of which are in scientific periodicals which would require much time and research before they yielded the required information.

Appendices include: I. Collecting and studying bugs, II. A glossary of scientific terms used in the text, and III. A list of plants and their associated bugs. There is also a very complete index.

The publishers have done well to put this most interesting book on the market, and we feel sure that it will have the wide appeal foreseen in this note.—S. N. A. J.

Endeavour XVIII (Number 72, pp. 200-210) carries an excellent article by Dr. H. B. D. Kettlewell on the subject of Brazilian insect adaptations, with four pages of coloured illustrations, providing room for some twenty-four of the wonderful colour photographs brought back

by the author from his recent visit to the part of Brazil visited by Charles Darwin. These photographs must bring home to those who have not the opportunity for travel, the fantastic examples of mimicry and camouflage in a way which would be quite impossible for words alone to convey. It may be remembered that I expressed regret that this author's first account of this expedition should have appeared in a popular paper, whose size made its preservation a matter of difficulty to the ordinary entomologist, so that the wealth of colour work, only possible to a periodical with a wide circulation, might eventually become lost. A more permanent repository for some of these photographs is provided by *Endeavour*.—S. N. A. J.

Entomologische Berichten (19: 235) records the capture of a male *Eugraphe subrosea* Steph. at Noordlaren, Holland, 19.viii.1959. Perhaps some of our regular users of the m.v. lamp will be recording this insect once more from this country!—S. N. A. J.

Flora og Fauna carries an illustrated note on *Ennomos autumnaria* Wernb. in Denmark, the illustration showing ten specimens showing some considerable range in marking.—S. N. A. J.

Zeitschrift der Wiener Entomologische Vesellschaft (70: 113 et seq.). Charles Boursin describes two species of *Hadena* new to Europe. These are *H. clara* Stgr. and *H. urumovi* Drenowski, with seven plates, three of imagines and four of genitalis dissections.—S. N. A. J.

Flowers in the desert

In Baja California del Norte, in an area that once was desert, nearly half a million irrigated acres now blossom pinky-white with cotton—an all important crop in this part of Mexico—and a crop that was recently threatened.

Nematodes were suspected of being responsible for the steadily decreasing yields and in 1956 an infestation survey was carried out—with startling results. Nearly a fifth of the acreage was found to be heavily infested with this pest. A comprehensive series of trials was carried out with Nemagon soil fumigant—and again the results were startling.

Dosage rates as low as $\frac{1}{2}$ gallon per acre (5 litres per hectare) gave yields $2\frac{1}{2}$ times those obtained in untreated soils—together

with larger bolls—yet there was no diminution in quality of the cotton lint or seed. Further, there was a marked reduction in cultivation and irrigation costs as a result of the more rapid growth. In Mexico, Nemagon is bringing more—and more profitable—'flowers in the desert'.

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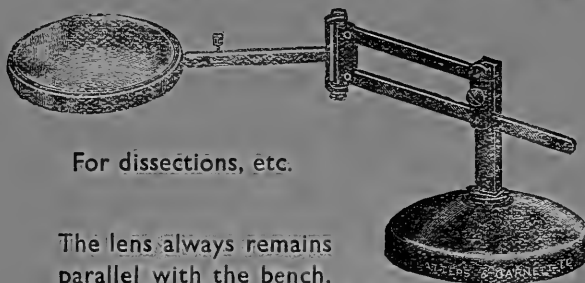
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(Founded by J. W. TUTT on 15th April 1890)

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The Entomologist's Record and Journal of Variation

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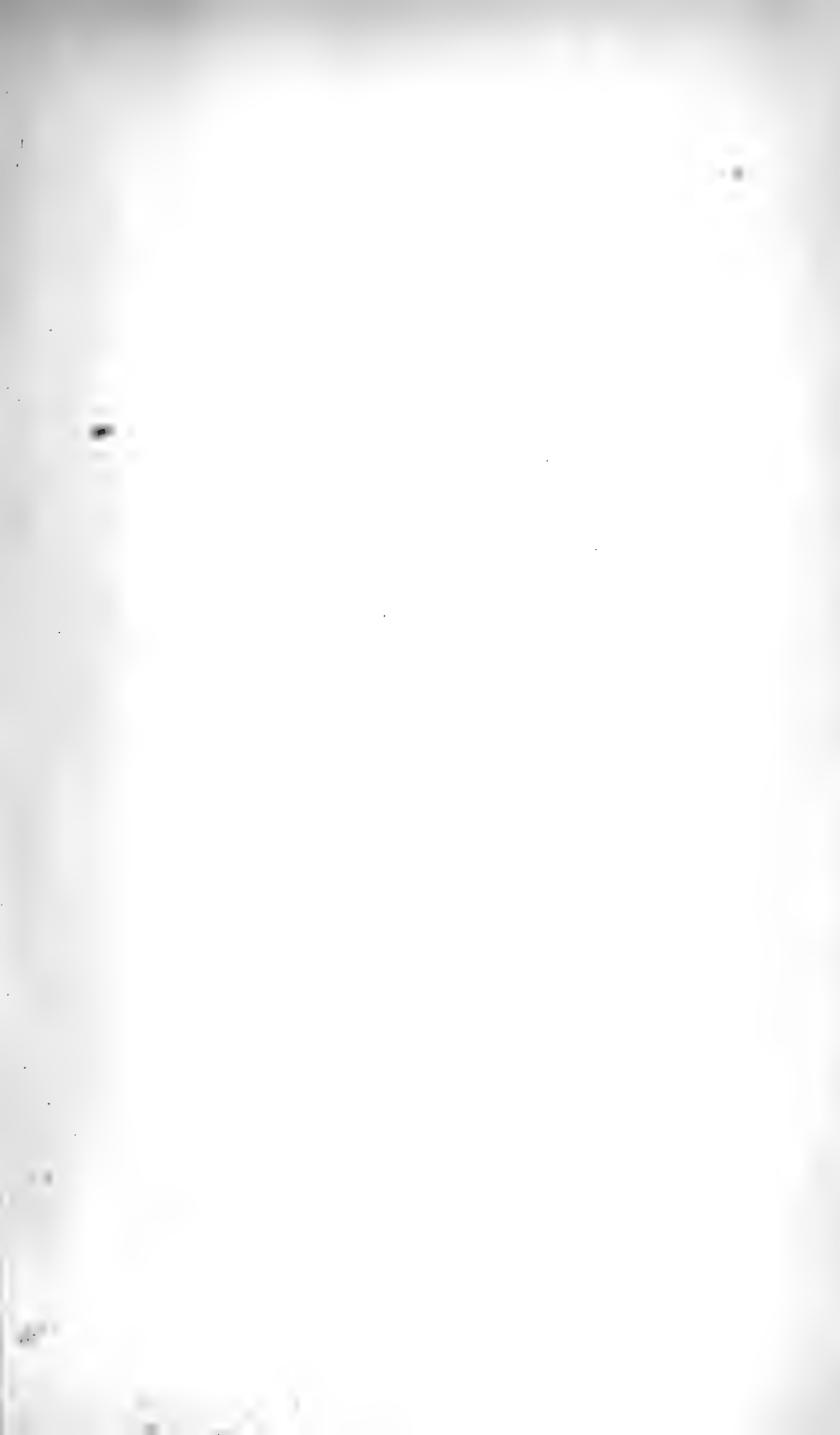
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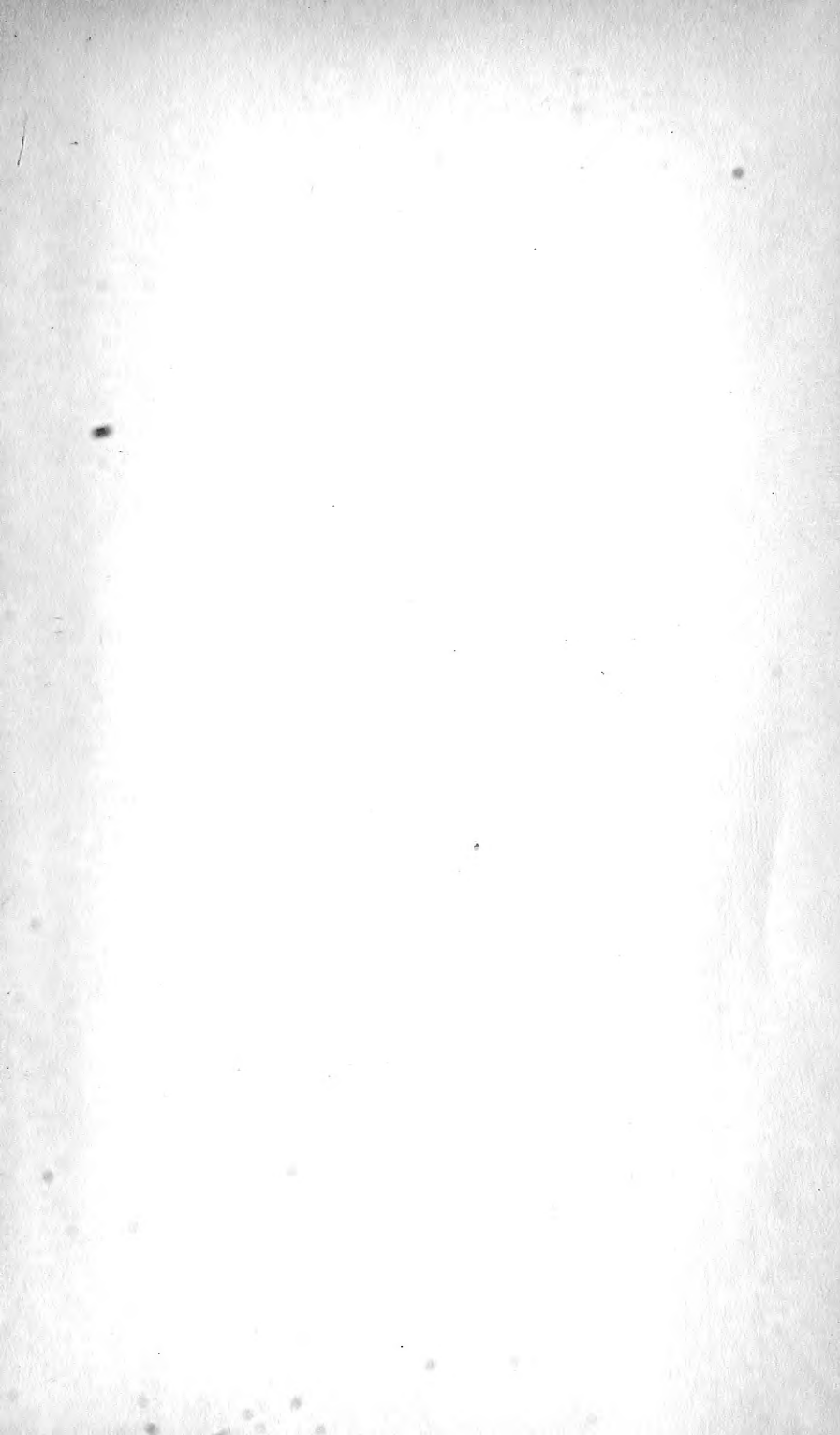
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